

**EURADOS Intercomparison 2009  
for Extremity Dosemeters  
in Photon and Beta Fields**

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## **Imprint**

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Issued by:

European Radiation Dosimetry e. V.  
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www.EURADOS.org

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## Abstract

EURADOS Working Group 2 (WG2) has developed a system for self-sustained intercomparison exercises (ICs) for individual monitoring services (IMS) for external radiation. The first IC, for whole body dosimeters in photon fields, was carried out in 2008 (IC2008). As a next step in the programme, an intercomparison was organized for extremity dosimeters in photon and beta fields, with 59 dosimetry systems from across Europe. IC2009 was organized by an organization group (OG) consisting of Tom Grimbergen from NRG (co-ordinator and co-ordinating laboratory), Andrew McWhan (Babcock International Group, at the time VT, plc), Ana Maria Romero (CIEMAT), Hannes Stadtmann (Seibersdorf Laboratories) and Markus Figel (Helmholtz Zentrum München).

The systems tested during this exercise included ring, stall and wrist dosimeters. In total 1298 dosimeters were irradiated in the selected fields of photons and beta radiation qualities on appropriate phantoms (ISO finger and pillar phantom) with the dose quantity personal dose equivalent  $H_p(0.07)$ . All irradiations were carried out according to the irradiation plan developed by the Organizing Group. These irradiations were carried out in selected reference irradiation laboratories accredited according to EN ISO/IEC 17025. The photon irradiations were performed at Seibersdorf Laboratories (Austria) and the beta irradiations at IRSN (France).

Many systems showed pronounced under responses especially at low energy beta radiations (Kr-85) and for beta irradiations with large angles of incidence ( $60^\circ$ ). In contrast, most systems showed good results for photon irradiations down to energies of 16 keV.

Additional information was provided by the participants to allow statistical analysis of the results with respect to different parameters, e.g. dosimeter type and detector material. The influence of these parameters on the dosimeter response values is analysed in this report.

A participants' meeting was held during the European Conference on Individual Monitoring of Ionizing Radiation (IM2010, Athens) to discuss general aspects of this intercomparison and specific systems problems.

The IC results can assist participants to show compliance with their quality management system, allow comparison of their results with those from other participants and, if required, develop action plans for improvement of their system. The high number of participants confirms that there is significant demand for international ICs and it is concluded that these are of significant operational value for IMSs.

Following the success of IC2008 and IC2009, it was decided to continue developing the programme of ICs. Each of these ICs will be eventually summarized in dedicated EURADOS reports.





## 1 Introduction

EURADOS working groups on Harmonisation of Individual Monitoring in Europe (1997-2000 [1,2], 2001-2004 [3]) have shown that intercomparison exercises (ICs) are a fundamental prerequisite for harmonisation of individual monitoring services (IMS). Consequently, these EURADOS working groups recommended periodic performance tests or ICs within the European Union (EU) and Switzerland to assist the objective of harmonisation. It was believed that ICs would encourage IMS to improve the quality of their results, provide information on IMS quality throughout EU and assist harmonisation of IMS quality control standards. Further support was provided by the response to questionnaires sent to IMS in the EU and non EU countries which showed very strong interest in participating in the proposed programme of periodic ICs.

In some countries participation in IC exercises is being considered as an essential criterion for approval of IMS by national authorities. At the same time, for regulatory and commercial reasons, many IMS are becoming accredited in compliance with the EN ISO/IEC 17025 standard [4] for which the participation in regular inter laboratory comparisons is a specific requirement. Participation in regular ICs is also specifically recommended in the new European Commission's Technical Recommendations for Monitoring Individuals Occupationally Exposed to External Radiation [5].

Anticipating on these developments, EURADOS decided in 2005-2006 to investigate the possibility of organizing a programme of self-sustained ICs. Following this investigation it was decided to organize the first IC within the framework of EURADOS. This first EURADOS intercomparison exercise, IC2008 for whole body dosimeters in photon fields, was completed in about one year [6]. The entire exercise was performed without any external funding with all costs being covered by the participants' fees.

Following the success of IC2008, EURADOS decided to continue with the programme of regular ICs by organizing a second IC in 2009, this time for extremity dosimeters for photon and beta radiation fields. This report describes the set-up of the IC2009 and gives an extended analysis of the results obtained.

## 2 Outline of the EURADOS Intercomparison 2009 project

### 2.1 Organization Group

The organizational structure for the EURADOS programme for self-sustained ICs for IMS, was laid down in the report of Working Group 2 (WG2) Subgroup 2 which was presented to the EURADOS Council at the annual meeting 2007 [7]. The report provided extensive plans for a self-sustained IC programme including detailed proposals for organization and financial aspects. The proposed plan was put into practice starting with IC2008 and was kept, essentially unaltered, for IC2009.

For each IC an Organization Group (OG) is appointed by EURADOS Council with the mandate to execute the IC. This group prepares, manages and controls all planning and operational details of the IC. This includes all material costs and data transfer between the participating IMS and the irradiation laboratories that will perform the irradiations. For efficiency reasons, the OG is limited to a relatively small number of persons which also assists to control of confidentiality as the information is handled by a very limited number of persons.

For IC2009 the OG was formed by the authors of this report, with NRG (the Netherlands) acting as the coordinating institute.

### 2.2 Scope

IC2009 was set up for comparison of extremity dosimeters used to measure the personal dose equivalent,  $H_p(0.07)$ . Allowed dosimeters types included ring, stall or wrist, designed to be worn on finger, wrist or ankle. The scope included irradiation in both photon and beta fields, although no mixed fields were applied.

### 2.3 Project set-up and phases

As for IC2008, four main phases can be defined, i.e. :

- 1) preparation,
- 2) application by candidate participants,
- 3) execution,
- 4) reporting.

In the preparation phase the OG decided on the scope, the irradiation plan, a provisional budget and the time schedule. After these details had been established, a suitable irradiation facility was identified. This was achieved by approaching a limited number of dosimetry laboratories for formal quotations. These quotes were evaluated for quality and availability. For the photon irradiations a few options fulfilled the minimum quality criteria, such as ISO 17025 accreditation as well as availability to deal with a large number of dosimeters (typically over 1.000) in an suitable time frame. However, for the beta irradiations, availability turned out to be the dominant issue. After considering the informal quotes, EURADOS Council decided, in accordance with the protocol set out in the OG proposal, to take an option on two laboratories; one for the photon irradiations and the other for the beta irradiations.

Terms and conditions for the participants were then established with limits set for maximum and minimum number of participants. EURADOS Council approved the budget and gave formal mandate to the OG to proceed with IC2009.

During the participant application phase IC2009 was formally announced on the EURADOS website and publicity was assisted by direct emailing of the announcement and application form to all IMS known to WG2, including all participants in IC2008. Candidate participants were invited to complete and return the application form. The OG then met and evaluated the status of all the applications. Once it became established that the minimum number of participants had been reached to make the IC financially viable, the decision was made to confirm the purchase order for the irradiations and to continue to the next phase.

The execution phase started with sending all candidate participants a confirmation of participation and a set of instructions. All participants were requested to prepare their dosimeters according to their normal procedures, and to provide the identification codes of the dosimeters to the coordinator using an electronic form (provided by the coordinator). The participants had to dispatch their dosimeters to the coordinating laboratory (NRG Arnhem, Netherlands) in accordance with the guidelines before the set deadline. The coordinating laboratory received and registered all dosimeters. A label was added to all dosimeters by the coordinator showing the identification number as provided by the participant and a code to be used by the irradiation laboratories. The code to be used by the irradiation laboratories consisted of a number identifying the dosimeter system and a number corresponding to a radiation quality, angle and dose range combination as established in the irradiation plan. Figure 1 shows an example of a dosimeter with label added by the coordinator. The dosimeters were forwarded to the first irradiation laboratory for photon irradiations. Once the photon irradiations were completed at the first irradiation laboratory, the dosimeters were forwarded to the second irradiation laboratory for the beta irradiations.



Figure 1. Example of a ring dosimeter with the label added by the coordinator. "S16" is the code to identify the dosimetry system (note: for presentation of the results, a different code was used). "28" is the code to identify a specific radiation quality, angle and dose range combination from the irradiation plan.

Following the beta irradiations the second irradiation laboratory returned the dosimeters to the coordinating laboratory where the organization labels were removed and the dosimeters shipped back to the participants. The participants received instructions on how to report their results including an Excel-sheet for digital transfer of the results. After the coordination laboratory received the results of the participants, response values were calculated by combining the results from the participants and the irradiation laboratories. The response values were individually reported back to each participant, with the request to the participant to check and to either confirm or comment on the results.

The OG met again and reviewed all the comments received from the participants on their results. Decisions were made on all requests for data amendment and the final results were then fixed.

The first task in the reporting phase was to prepare the Certificates of Participation. Then, the participants meeting was prepared to present the results and allow discussion between OG and participants. This meeting was tailored to coincide with the European Conference on Individual Monitoring 2010 (IM2010) held in Athens. The participants present at this meeting received their Certificate of Participation which includes information on the irradiation qualities, radiation doses, response values and overall uncertainties. The participants who did not attend the meeting received their Certificates of Participation by post. Finally, at the end of the reporting phase it was decided to publish the results in a EURADOS report and in the open literature as scientific communications presented at conferences and/or papers published in scientific journals [8].

The IC application and execution phases were completed within one year but the OG needed additional time for initial preparation and completing the associated reports following the execution phase. The main milestones in the time schedule are summarized in Appendix A: Time schedule.

## 2.4 Irradiation plan

All radiation qualities and the nominal dose values were specified by the OG in an irradiation plan. Details about this plan were confidential and only known by the coordinator and the irradiating laboratories. In addition, the OG requested the irradiation laboratories to vary the dose values  $\pm 20\%$  from the nominal value. The exact dose values for each irradiation were selected and thus known only by the irradiation laboratories.

For the IC2009 a total of 28 dosimeters from each participant IMS were requested.

The plan aimed at a rough estimation of:

- > bias and the linearity of the participating systems over limited range,
- > reproducibility of the system for identical irradiations,
- > energy and angular dependence for both photon and beta fields.

The initial irradiation plan is given in Table 1.

Table 1: Initial irradiation plan for the EURADOS 2009 intercomparison for extremity dosimeters in photon and beta fields. Definition of nominal dose ranges: "Low" (1 - 10 mSv), "Medium" (10-100 mSv), "High" (100 - 1000 mSv).

Radiation	Quality	Nominal Hp(0.07) mSv	Number of dosimeters
Beta	Kr-85; 0°	Medium	2
	Sr-90/Y-90; 0°	Medium	2
	Sr-90/Y-90; 60°	Medium	2
Photon	W-80; 0°	Low	2
		Medium	4
		High	2
	W-80; 60°	Medium	2
	N-20; 0°	Medium	2
	N-150; 0°	Medium	2
	S-Cs; 0°	Medium	2
Spare/background			6

To clarify the scope of the IC to the candidate participants, the following information was given in the participant application phase:

*The intercomparison is for extremity dosimeters intended to estimate Hp(0.07). The dosimeters may be of type ring, stall or wrist, designed to be worn on fingers, wrist or ankle, and are used routinely in individual monitoring of exposed workers. Irradiations, restricted to photons and beta's, will be performed in European accredited irradiation facilities in terms of Hp(0.07) in the following ranges:*

- Photon energy: 16 to 662 keV
- Beta mean energy: 250 to 1000 keV
- Dose: 0,5 mSv to 1 Sv
- Angle of incidence: ± 60°

This information was provided in order to give the candidate participants the opportunity to decide if the IC would be suitable for their dosimetry systems. Participants were allowed the choice of which irradiations the results would appear on the official certificate: photons and beta's,

photons only or beta's only. However it was decided to irradiate all systems in exactly the same way, i.e. both in the photon and the beta fields.

## 2.5 Participants

44 IMS from 18 European countries participated with a total of 59 dosimetry systems including 46 finger ring dosemeter systems, 4 stall (finger tip) dosemeter systems, and 9 wrist/ankle dosemeter systems. Most systems were based on thermoluminescence detectors (TLD). Table 2 indicates the number of systems from the different countries.

Table 2: Number of participating systems per country

Country	Number of participating systems per country
Italy	10
Germany, United Kingdom	7
Belgium, Spain, The Netherlands	5
Greece, Poland	3
Czech Republic, France, Slovenia, IAEA	2
Denmark, Finland, Ireland, Portugal, Serbia, Switzerland	1

A complete list of the participating institutes is given in Appendix B: List of participants.

According to the information provided by the participants the systems were subdivided in photon-beta dosemeters (PhB), photon dosemeters (Ph) and beta dosemeters (B). Systems for which the participant asked to include in the certificate both the results for photon and beta irradiations were regarded as photon-beta dosemeters (37 systems). Systems for which the participant asked to include in the certificate only the results for photon irradiations, were regarded as photon dosemeters (20 systems). Likewise, systems for which the participant asked to include in the certificate only the results for beta irradiations, were regarded as beta dosemeters (2 systems). The number of systems for these categories and subdivided for each type of hanger is shown in Figure 2.

Figure 3 summarizes the systems subdivided in categories based on the specific detection materials used in the dosemeters. The majority (88%) of the participants used TLD detectors of the LiF-family, almost equally distributed between LiF: Mg,Ti and LiF: Mg,Cu,P.

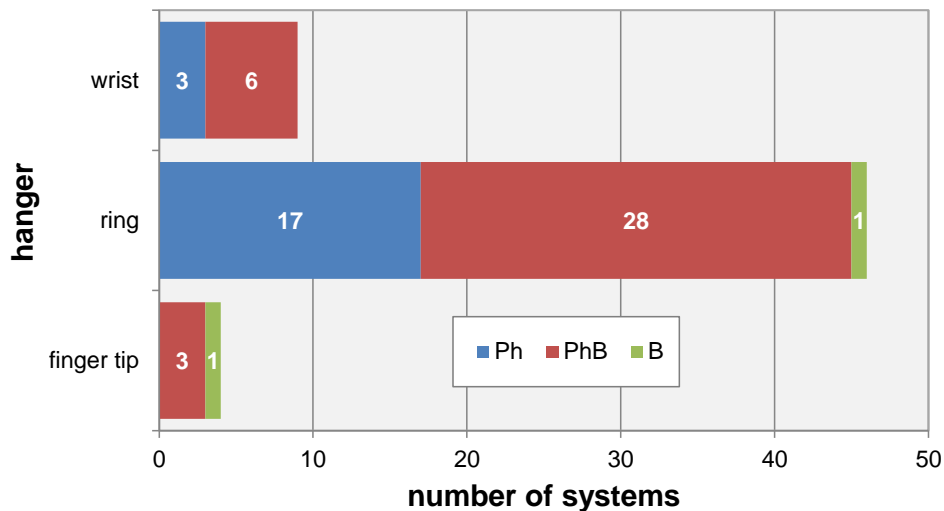


Figure 2: Number of systems per dosimeter hanger type (Ring, Wrist/ankle, Finger tip). The colors correspond to the system information as provided by the participants: used and/or designed for the measurement of photons (Ph, blue), for photons and beta's (PhB, brown) and only for beta's (B, green).

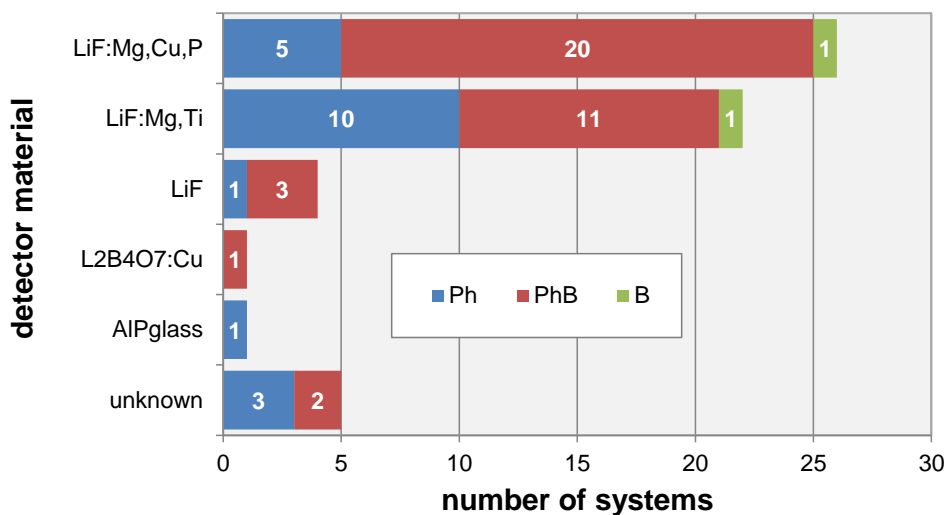


Figure 3: Number of systems using different types of types detectors as reported by the participants ("unknown" means this information was not given by the participant). The colors correspond to the system information as provided by the participants: used and/or designed for the measurement of photons (Ph, blue), for photons and beta's (PhB, brown) and only for beta's (B, green).



Figure 4: Photo of different types of ring dosimeters



Figure 5: Photo of different types of wrist dosimeters





Figure 6: Photo of different types of finger tip dosimeters

## 2.6 IC2009 Intercomparison procedure compared to ISO14146

IC2009 was set up to meet the standard ISO14146 “Criteria and performance limits for the periodic evaluation of processors of personal dosimeters” [9] and compliance was reached for the following items:

- > Quantities measured
- > Standard test conditions
- > Maximum accumulated photon radiation background
- > Radiation qualities and angles
- > Dose range
- > Evaluation sample size
- > Number of background and spare dosimeters
- > Evaluation procedure
- > Evaluation sequence

However, on some items it was impossible to fulfil the ISO14146 requirements. The main deviations from the standard were:

- > The “evaluating organization” **did not** send a representative *to select the dosimeters and to observe that no special effort is made in processing them, to ensure that the processing of the evaluation dosimeters is carried out in exactly the same way as for the processor’s normal customers*

- No “qualification body” involved (for approving dosimetry services)
  - *The qualification body shall deem competent each processor which is able to show compliance with the performance limits...*
  - *The qualification body shall provide the processor with a certificate which specifies at least the dosimetry system and the period of validity.*

Obviously it is impossible to comply with ISO14146 because an IC deviates from a performance test in a few fundamental and practical aspects.

- In an IC, there are many participants, and the organizer is not able to visit all these participants.
- The performance test should be tailored to the specifications of the dosimetry system tested, which may or may not be controlled by national requirements. In an international IC the participating systems may cover a wide range of systems with different specifications for dose and energy ranges covered.
- For the participants it is very difficult to avoid deviating from routine procedures, e.g. because:
  - the dosimeters have to be send to a foreign address,
  - the time period the dosimeters leave the service deviates from what is normal,
  - steps have to be taken to prevent the results from being transferred to registries of radiation workers,
  - the method for the background correction may differ from normal practice.

Since EURADOS cannot play the role as “qualification body”, the participant has the responsibility for making their participation in the IC a useful exercise for their IMS, e.g. for supporting their accreditation process. The participant is strongly advised to record (for their own use) all deviations from routine procedures. When appropriate, the participant will have to justify these deviations to their accreditation organization and explain any impact on the results. Therefore it is in the interest of the participant to restrict these deviations from normal practice to the minimum.

For above mentioned reasons, EURADOS does not provide the participants with any assessment of their individual results but only with the ratio between the measured dose and the conventional true value.

However, for the analysis of the global results, the performance limits according to ISO 14146, commonly known as “trumpet curves”, were adopted:

$$\frac{1}{F} \left( 1 - \frac{2H_0}{H_0 + H_c} \right) \leq R \leq F \left( 1 + \frac{H_0}{2H_0 + H_c} \right) \quad (1)$$

where  $H_c$  is the conventional true value,  $R$  is the response or the ratio between the measured value and conventional true value,  $F = 1.5$  and  $H_0$  is the “lower limit of the dose range for which the system has been approved”. For this IC  $H_0$  was not tailored to each individual participant. Instead, a

value of 1 mSv was chosen for  $H_0$  for all participants, in accordance with the value stated for the maximum detection threshold in ISO 12794 [10].

The standard ISO 14146 allows a maximum of one-tenth of the irradiated dosimeters to exceed the above limits but, for the analysis of the global results in this report, any result exceeding these limits was considered as an outlier.

## 2.7 Execution of the irradiations

The irradiations were performed with photons according to ISO 4037 [11] and beta's according to ISO 6980 [12] on appropriate phantoms (ISO finger or pillar phantom) in terms of the personal dose equivalent  $H_p(0.07)$ . These irradiations were carried out at the accredited reference laboratories of the Seibersdorf Laboratories (Austria) and of IRSN (France). The set-up of the irradiations performed at the Seibersdorf Laboratories are shown in Figure 7 and were described in more detail in a separate paper [13]. In contrast to the previous IC, no mixed field irradiations were used for IC2009. After approval by the OG the irradiation laboratory replaced the originally proposed quality N-120 by N-150, to reduce the irradiation time. At the request of the coordinator, the irradiation laboratory varied the actual doses around the nominal values given in the irradiation plan by as much as  $\pm 20\%$ . Table 3 shows a summary of the actual doses imparted for the different radiation qualities.



Figure 7: Irradiation set-up of finger ring dosimeters positioned on the ISO rod phantom in front of the MG320 X-ray facility at the accredited reference dosimetry laboratory of the Seibersdorf Laboratories (Austria).

Table 3: Summary of the actual radiation qualities and doses imparted,  $H_p(0.07)$ 

radiation type	radiation quality	quality (short)	max. beta / mean photon energy (keV)	number of irradiated dosimeters	nominal $H_p(0.07)$ (mSv)	range $H_p(0.07)$ (mSv)
Beta	Kr-85; 0°	(Kr)	687	2	25	22.0 - 28.2
	Sr-90/Y-90; 0°	(Sr)	2274	2	10	8.2 - 11.5
	Sr-90/Y-90; 60°	(Sr60°)	2274	2	10	8.5 - 11.7
Photon	N-20; 0°	(N20)	16	2	40	32.1 - 48.0
	W-80; 0°	(W80L)	57	2	5	4.0 - 6.0
		(W80M)	57	4	50	39.9 - 60.3
		(W80H)	57	2	400	320 - 480
	W-80; 60°	(W80M60°)	57	2	50	40.0 - 60.2
	N-150; 0°	(N150)	118	2	25	20.0 - 30.1
	S-Cs; 0°	(Cs)	662	2	30	24.0 - 36.0

The laboratory reported the irradiation data to the coordinating laboratory by means of irradiation certificates (see Appendix C: Example irradiation certificate).

## 2.8 Background and transit dose control

For each dosimetry system six dosimeters were reserved as “background and transit dose control” dosimeters to allow for background and transfer dose corrections. In addition, one or more of these dosimeters could be used by the irradiation laboratory in case of damage or errors with the irradiations. Only a few dosimeters had to be used for this purpose.

All dosimeters were sent together in a single shipment to the first irradiation facility. After irradiation the dosimeters were forwarded to the second irradiation laboratory. Finally, the second laboratory sent the dosimeters back to the coordinator. Four active personal dosimeters were included in the shipment by the coordinator to detect any possible additional irradiations during each shipment between the coordinator and irradiation laboratories.

The organizer provided the participants with the identification codes of the unused “background and transit dose control” dosimeters. The participants were instructed to evaluate the dosimeters according to the normal routine procedures as far as possible. The participants reported the results back to the coordinator in terms of  $H_p(0.07)$ .

## 2.9 Confidentiality of the data and the results

The data processed by the OG members had to be treated confidentially for two specific reasons:

**Firstly**, the IC was designed to be a blind test for all the participants. This meant that all participants had to report the results of the evaluations without knowing the details of the irradiation plan, in particular the reference dose values. The reference dose values were reported

to the participants only *after* the coordinator had received the results of the evaluations from the participants. At the time of application for the IC, only the ranges of dose, energies and angles were known to the participants. Direct communication between participants and irradiation facilities was not allowed. Only the coordinator exchanged all necessary information between the participants and the irradiation laboratories. It was known that some IMS would participate with more than one dosimetry system and it was also considered that some IMS might have access to results of other participants. In order to prevent these participants from guessing reference dose values by combining results, the irradiation plan was executed in a random order for each participant. In addition, the irradiation laboratory varied the dose values in the irradiation plan within specified ranges from participant to participant, rather than using fixed dose values for each radiation quality.

**Secondly**, the individual results are the property of the participants only and thus have to be kept confidential. To assure this confidentiality the coordinator separated all information which could possibly lead to the identity of the participants from the published results. In the overviews of the results the participating dosimetry systems are only referenced by a randomized code. The link between this code and the participant's identity is only known by the coordinator. All participants received their own code to be able to look up their own results in the overviews.

During the IC exercises significant quantities of data had to be exchanged. In order to assure data integrity it was decided to use parallel data streams. All official results were reported on signed papers. In parallel data was exchanged in electronic formats for efficient processing and to prevent typographic errors. In case of any ambiguity the data on the signed papers was taken as "true".

## 2.10 EURADOS Certificates of Participation and Participants Meeting

Since EURADOS itself is not accredited for the evaluation of IMS, the results issued by EURADOS itself cannot be regarded as an official test report. As an alternative, it was decided to report back the results to the individual participants in the form of a "Certificate of Participation", including the irradiation reports provided by the accredited irradiation laboratories as an annex.

These certificates consisted of two pages. The front page showed the certificate number, the details of the participant and the description of the system as given by the participant, and a summary of the IC procedure. The front page was signed by both the EURADOS Chairperson and the IC coordinator. The second page showed the actual results: for each dosimeter (coordinator's id and participant's id), irradiation quality, value of  $H_p(0.07)$  as reported by the participant, value of  $H_p(0.07)$  as reported by the irradiation laboratory, and the response ratio of these two values. Only the results were included for the type(s) of radiation (photons, beta's) which the participant had requested on the application form. Copies of the relevant certificate(s) of the irradiation laboratories were added as attachments, as well as a copy of the dose reports provided by the participants. In the Certificates, no performance limits were indicated because these might differ from one participant to the other (see Appendix D: Example "Certificate of Participation")

In the reporting phase the coordinator prepared the Certificates of Participation. The OG prepared a participants meeting, as a satellite meeting of the European Individual Monitoring Conference IM2010, held in Athens. At this meeting the organization of the whole exercise was presented, including presentations from representatives of the irradiation facilities as well as the experience

of two participants. The results of the intercomparison were presented and discussed among the OG and the participants. The participants received their Certificate of Participation including information on the irradiation qualities, doses imparted, response values and overall uncertainties.

## 3 Results and Discussion

### 3.1 Review of the comments received from participants

After sending the draft results to the participants, the following comments were received from six participants:

- all results were wrong due to a communication error in the IMS (one participant),
- request to change or leave out one specific result because there had been a writing error at the IMS (one participant),
- request to include an additional correction for fading (one participant),
- request for corrections based on the knowledge of the specific radiation qualities and angles in the irradiation plan (two participants),
- request to leave out the results for the N-20 quality, because this quality was outside the energy range which the IMS had stated on their application form (one participant).

None of the above requests were considered to justify revising any of the results. Therefore the OG decided to leave all results unchanged. However in the certificate of the participant requesting to leave out the N-20 results, a note was added stating that this quality was “outside rated range as indicated by the participant on the application form”. Furthermore, in some graphs in the next paragraphs, the results of the system with all results wrong were left out to prevent that these results would dominate the overall statistics.

### 3.2 Basic statistical results

The numerical results of this IC are reported as response ratios, where the response  $R$  is defined as:

$$R = \frac{H_p(0.07)_{\text{participant}}}{H_p(0.07)_{\text{reference}}} \quad (2)$$

Table 4 shows the total number of results, together with estimates for the central value of the distribution of response values (arithmetic and geometric mean, median value) and measures for the spread in the response values (standard deviation, 2.5th and 97.5th percentiles). Distinction is made between “All results” and “Results in certificates only”, where the latter excludes the results for those types of radiation for which the participant indicated in the application form that these should be excluded from the certificate (e.g. beta irradiations for a photon dosimeter).

Table 4: Total number of results, and some statistical quantities indicating the central values and spread of the results.

	All results	Results in certificates only
Number of reported values	1298	1146
Arithmetic mean	0.96	1.01
Geometric mean		0.90
Median	1.02	1.04
Standard deviation	0.42	0.40
2.5 <sup>th</sup> -percentile	0.08	0.11
97.5 <sup>th</sup> percentile	1.59	1.61

Both the arithmetic mean and median values were close to unity. The geometric mean could not be calculated for "All results" because the measured values (and hence the response) were reported as 0.0 mSv (zero) for 4 systems for the Kr-85 quality.

The standard deviation for all results amounted to 0.42, reflecting a rather large spread in the response values. From the percentiles the 95% coverage intervals of the responses for all participants together can be derived: this was 0.08 – 1.59 for all reported values.

152 results were excluded from the certificates according to the dosimeter specifications given by the participants on the application forms. The zero response values mentioned above were all excluded, which means that the geometric mean could be calculated for this set of data. However, the other statistical quantities (arithmetic mean, median, standard deviation, etc.) didn't improve significantly for this set of data compared to the complete set of results.

### 3.3 Distribution of response values

Figure 8 shows the frequency distributions and the cumulative distributions of the response values. For "All results" the response values ranged from zero to 3.82, while for "All results in certificates" the response values ranged from 0.04 to 3.82 (maximum values lie outside the range of Figure 8). Figure 9 also shows the frequency distributions and the cumulative distributions of the response values in the certificates, but separated per type of irradiation (photons and beta's).



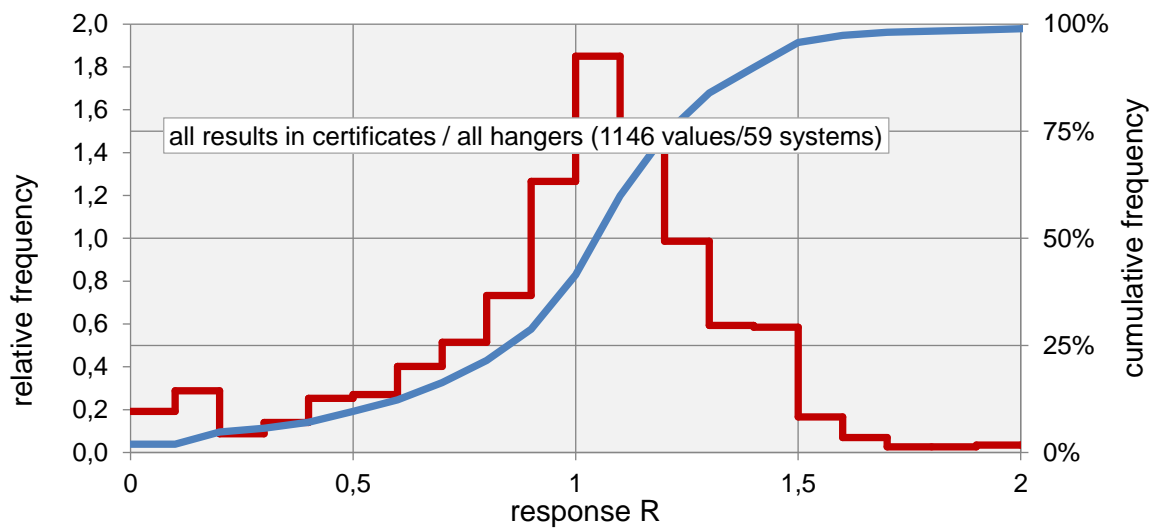
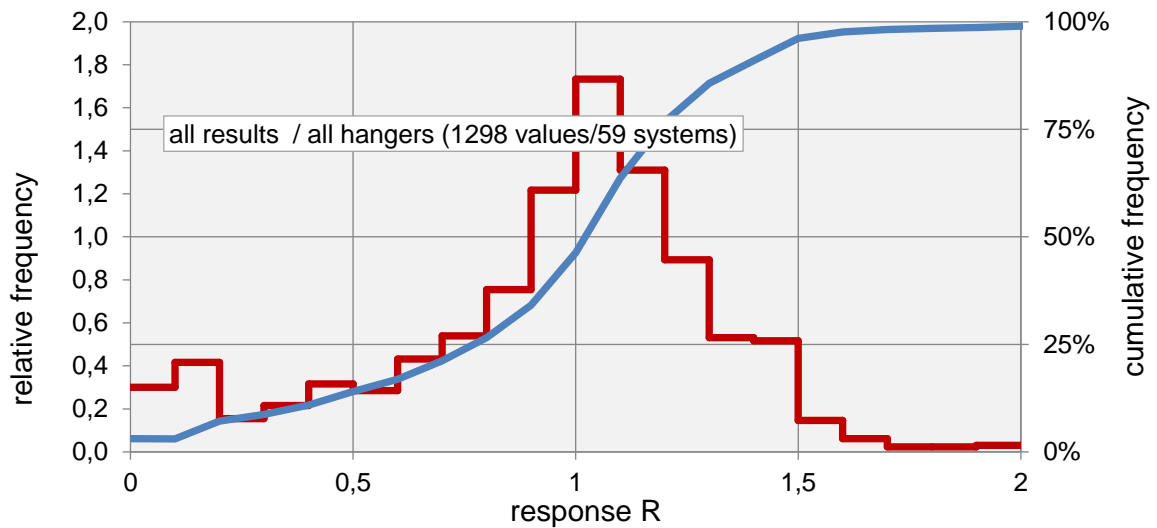


Figure 8 a,b: Frequency distributions and the cumulative distributions of the response values; above: all results including those which were not given in the certificates; below: only the response values given in the certificates are shown. As indicated by the cumulative frequency curve, some values were out of the range of the x-axis.

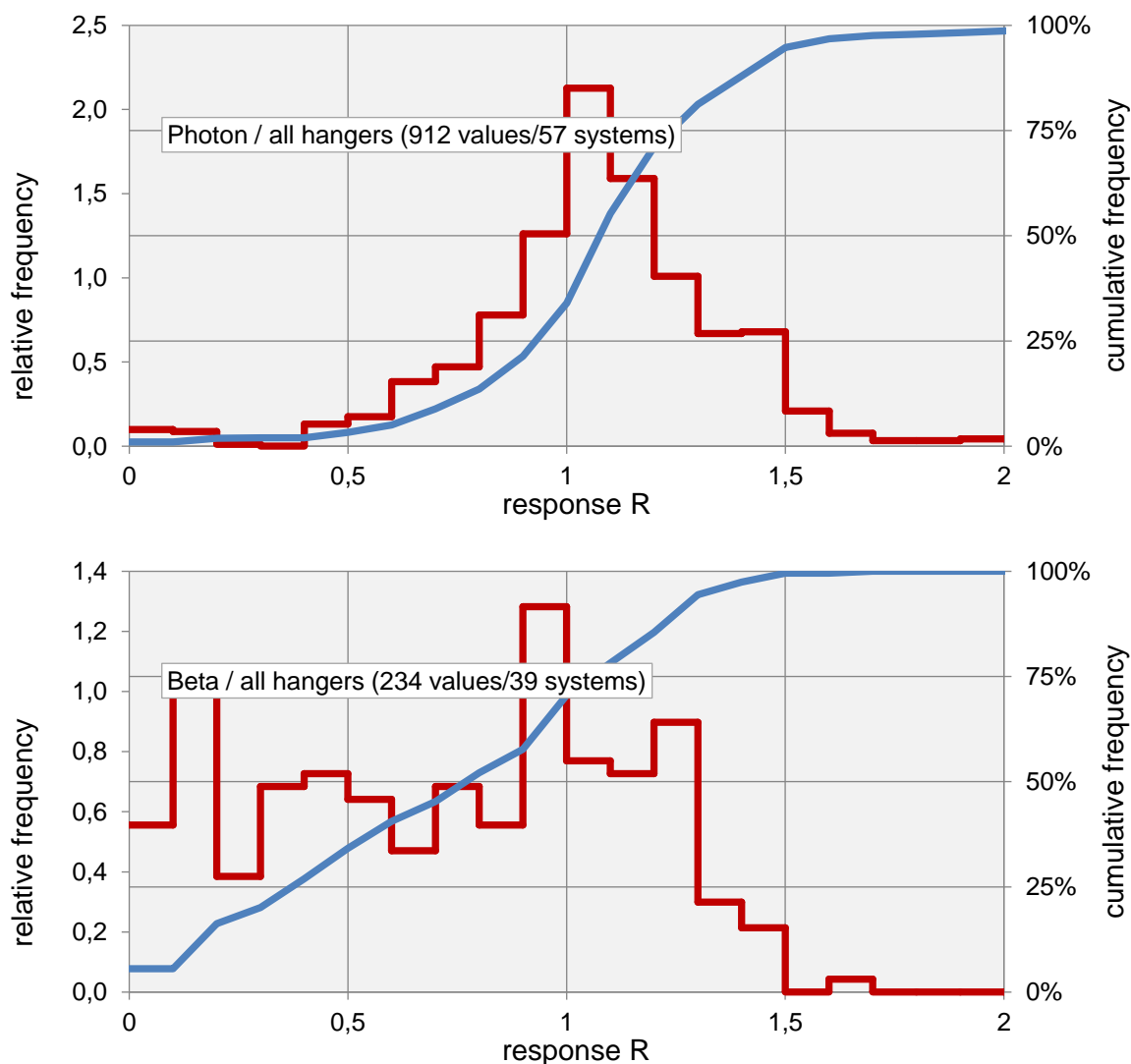


Figure 9 a,b: Frequency distributions and the cumulative distributions of the response values separated for photon and beta irradiations. Only response values given in the certificates are shown. As indicated by the cumulative frequency curve, some values were out of the range of the x-axis.

### 3.4 Distribution of response values per radiation quality

Subdividing of the results per radiation quality results in Figure 10 and Figure 11 where the distribution of results is expressed in the diagrams by the median value (diamond), the 50% range (box), the 90% range (bar) and the maximum and minimum values (dots).

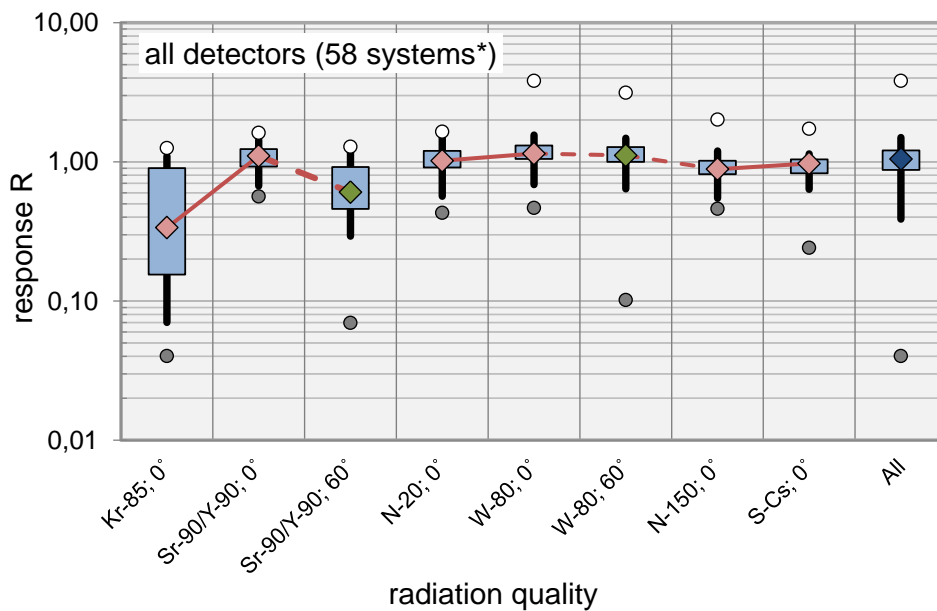


Figure 10. Distributions of response values (Results: "In certificate only") for different radiation qualities. Values for W-80; 0° include all dose ranges (L M, H). Diamond (Median), Box (50% range), bar (90% range), Dots (minimum, maximum). One system (all results wrong) was excluded in this diagram, this is the meaning of the \* (see remark section 3.1).

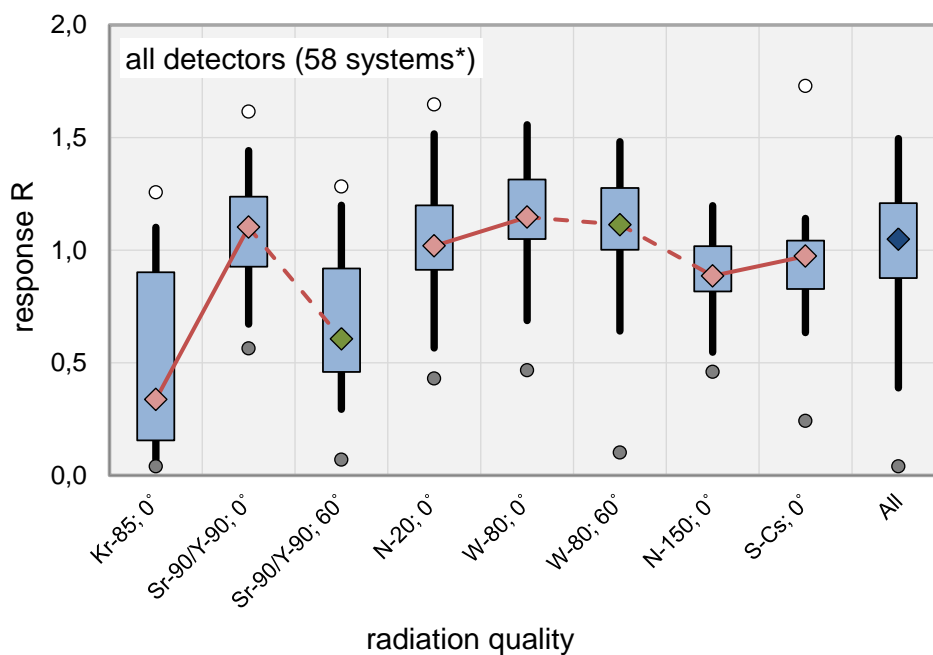


Figure 11. Same as Figure 10, but with the y-axis adjusted to a linear scale (some values are off scale).

Figure 10 summarises the results for the different irradiation categories for all systems (“Results in certificates only”). Figure 11 shows the same results, but the scale of the y-axis has been adjusted to a linear scale. The median of all response values of all systems for all radiations (furthest right bar in the diagram) is close to 1. While the 50% box is still close to unity, the 90% bar includes results with significant under response. A pronounced under response for many systems is obvious for Kr-85 and Sr-90/Y-90; 60° beta irradiations. The extreme values for all qualities cover the range from 0.04 to 3.8. Except for these beta irradiations, none of the qualities shows a clear bias. Nevertheless it is clear that the S-Cs quality, which is common to use as a reference energy for calibration, shows the smallest spread of response values.

Figure 12 shows the same figure for all results (including the results which were excluded from the certificates). An expected difference is the lower median values for the Kr-85 and Sr-90/Y-90; 60° beta irradiations.

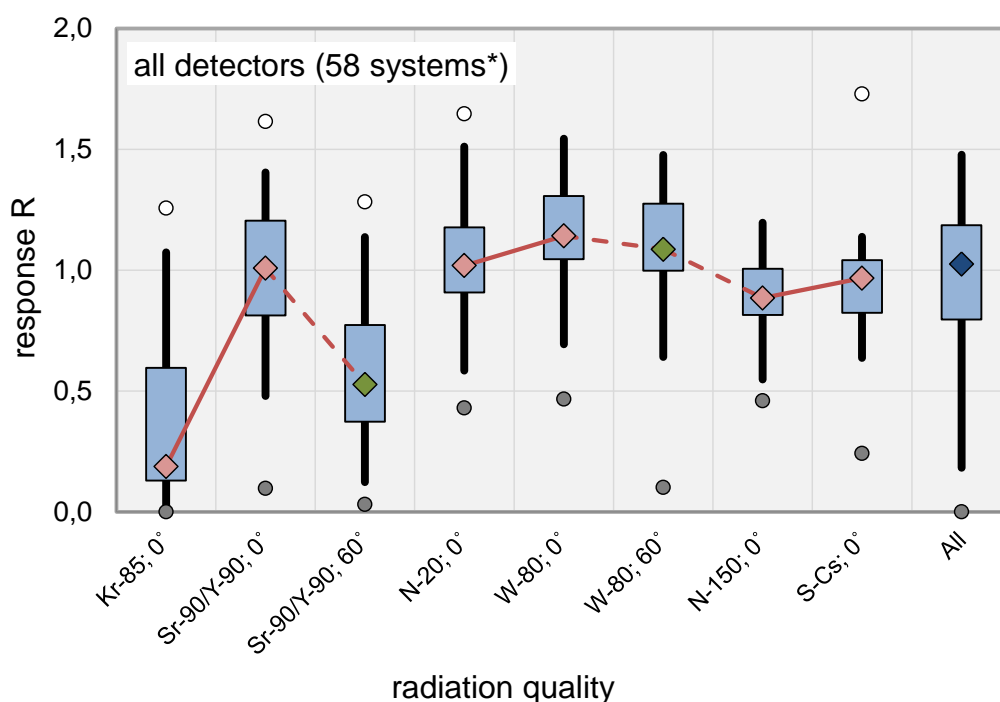


Figure 12. Same as Figure 11, except that all results (also values not given in the certificates) have been included (some values are off scale). One system (all results wrong) was excluded, see remark section 3.1.

The same results subdivided per type of system are presented in Figure 13 for photon-beta dosimeters (PhB) and in Figure 14 for photon dosimeters (Ph). As explained before in Section 2.5, systems for which the participant asked to include in the certificate both the results for photon and beta irradiations, were regarded as photon-beta dosimeters (PhB). Systems for which the

participant asked to include in the certificate only the results for photon irradiations, were regarded as photon dosimeters (Ph). Likewise, systems for which the participant asked to include in the certificate only the results for beta irradiations, were regarded as beta dosimeters (B). Since there were only two beta dosimeter systems, the results for these system were excluded from this subdivision as this might compromise confidentiality.

This subdivision makes clear that the median values for beta irradiations (especially the Kr-85 and Sr-90/Y-90; 60° beta irradiations) were lower for the photon dosimeter systems compared to those for the photon-beta dosimeter systems. The range of results for these qualities for the photon dosimeter systems was smaller than that for the photon-beta dosimeter systems. This is probably caused by the fact that most of the declared photon dosimeter systems have little response for low energy beta's or for irradiation with Sr-90/Y-90 under large angles.

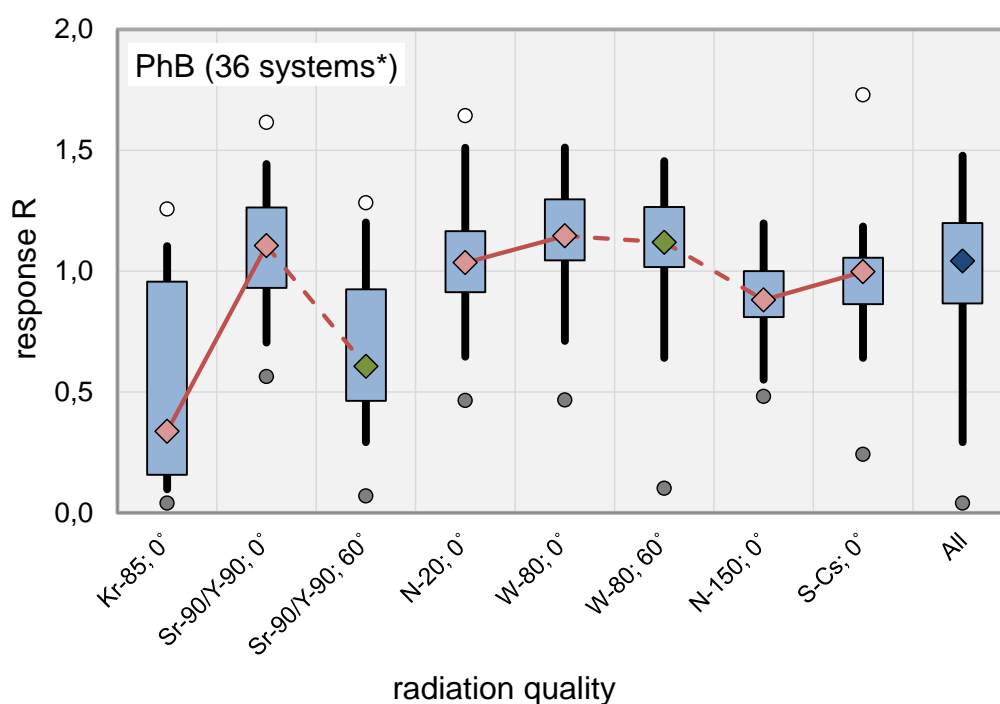


Figure 13. Same as Figure 12, but only for "Photon-Beta dosimeter" systems. One system (all results wrong) was excluded (see remark section 3.1)

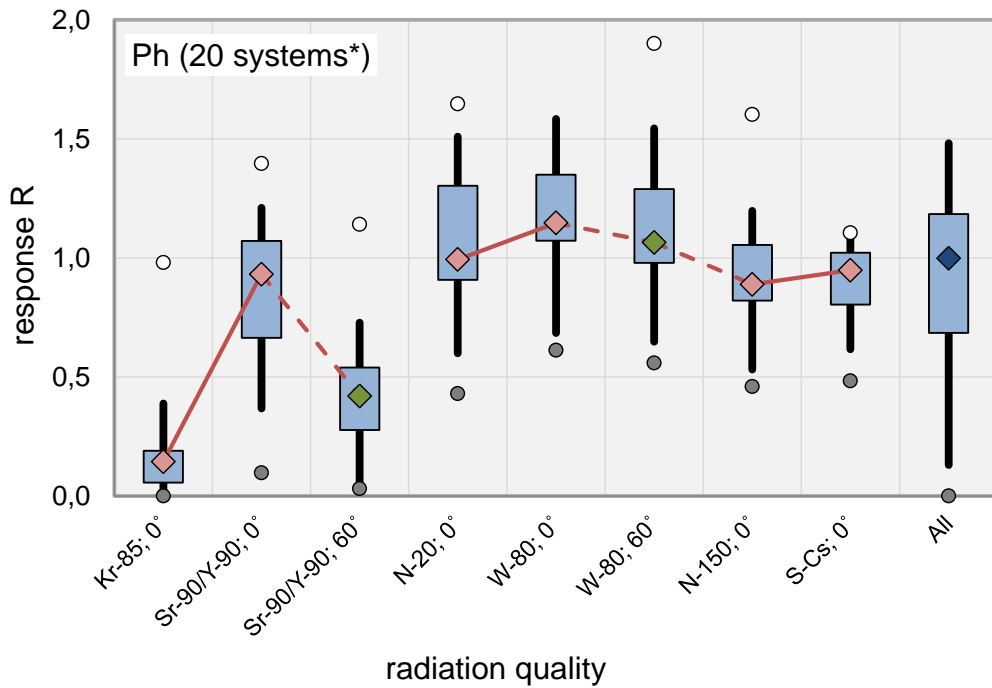


Figure 14. Same as Figure 12, but only for “Photon dosimeter” systems. Note, that nevertheless the response values for beta irradiations are given here (these values are not stated in the certificates).

### 3.5 Response values for different TLD detector materials

From the detector material used by the participants, LiF:Mg,Cu,P and LiF:Mg,Ti were the two most frequently used. Figure 15 and Figure 16 show the distributions of response values for the systems using these detector materials.

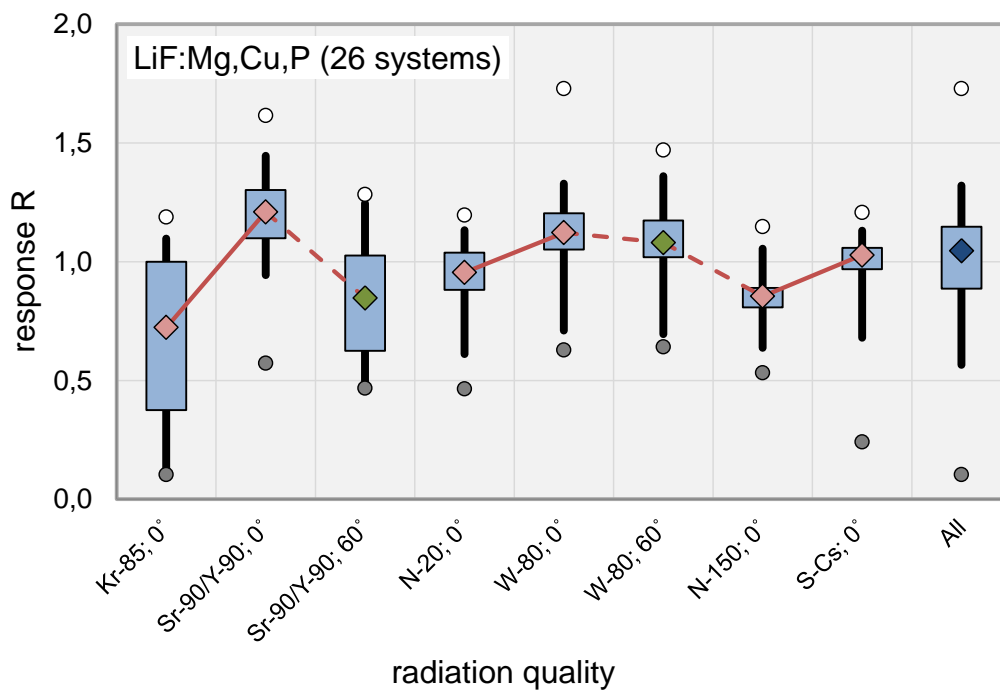


Figure 15. Distributions of response values for systems using LiF:Mg,Cu,P as detector material

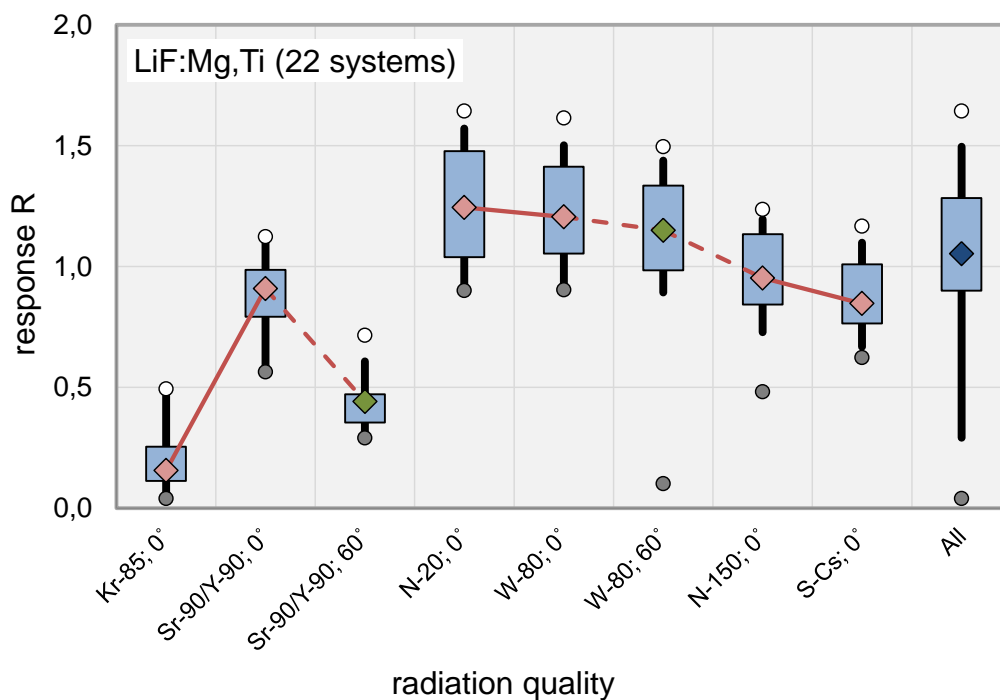


Figure 16. Distributions of response values for systems using LiF:Mg,Ti as detector material

Half of all systems use LiF:Mg,Ti as detector material. The typical over response for lower energy photons is observed in this case. For the high sensitive LiF:Mg,Cu,P the response for beta irradiations is superior to that of LiF:Mg,Ti. In addition, however both the entrance filter thickness and the detector thickness influencing the energy response for betas and low energy photons due to (self) absorption need to be considered here. No information about detector thickness was provided by the participants. The higher sensitivity of LiF:Mg,Cu,P enables however the production of thinner detector elements with sufficient sensitivity compared to LiF:Mg,Ti. Therefore an obvious explanation for the observed superior beta sensitivity of LiF:Mg,Cu,P based dosimeters could be the possible use of thinner - since more sensitive - detector elements. A separate paper [14] describes the influence of detector material on the results for both this intercomparison (IC 2009) and the previous one (IC 2008).

Information about filter thickness and material was asked for in the application form, but the information provided by the participants was not accurate enough (e.g. missing units) to make a comprehensive statistical analysis. However, all systems with responses values close to unity for Kr-85 (response values between 0.8 and 1.2) had stated filter thicknesses ranging from 10 mg.cm<sup>-2</sup> down to about 3 mg.cm<sup>-2</sup>. Obviously the well-known design criteria detector thickness and filter thickness are important especially for beta dosimeters.

### **3.6 Angular response and linearity**

To study the directional response in more detail the ratio of response values for 60° and that for 0° were calculated for the Sr-90/Y-90 and W-80 qualities (Figure 17). For photons the angular dependence is quite low for most systems, whereas this effect is significant for beta radiation. Half of all angular responses (at 60°) are below 0.59 for Sr-90/Y-90.

To studying their linearity of the participating systems 3 different dose values (L .. low, M .. medium, H .. high) for one radiation quality (W-80) were selected in the irradiation plan. The ratio of the corresponding response values are plotted in Figure 17 right side. Most systems show a ratio close to 1 meaning no influence of the response value by the dose value itself. However, a few systems show ratios strongly deviating from unity (>1.5 or < 0.7) indicating strong non linearity of the corresponding systems.



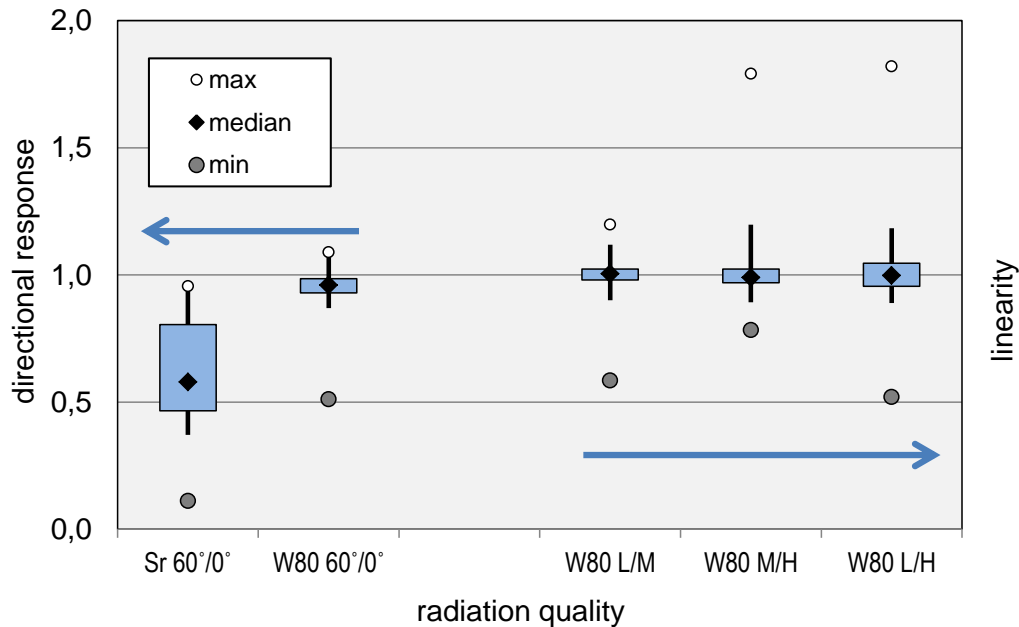


Figure 17. Left: Angular dependence of response plotted as distributions of the ratios of response values at 60° and 0°, two radiation qualities Sr-Y and W-80. Right: Linearity at the W-80 radiation quality, plotted as distributions of ratios of response values for different dose ranges (Low, Medium, High). Symbols like in Figure 1. Diamonds: median ratios; bars: 50% intervals; lines: 90% intervals; dots: minimum and maximum ratios.

### 3.7 Reproducibility

In accordance with the irradiation plan, all irradiations were done in pairs, except for the W80M quality where four values were available. As a measure of the reproducibility of the results, the relative standard deviation or coefficient of variation (CV) for all grouped results was calculated. Figure 18 shows the distribution of these CV values. For more than 50% of the grouped values the relative standard deviation was 2.7% or less. For 10% of the grouped values the relative standard deviation exceeded 11%. The highest CV values occurred generally at high angle irradiations (60°) and for irradiations with low energy beta's (Kr-85). Additional data and distributions are given in the Appendix E in Figure 22 and Figure 23.

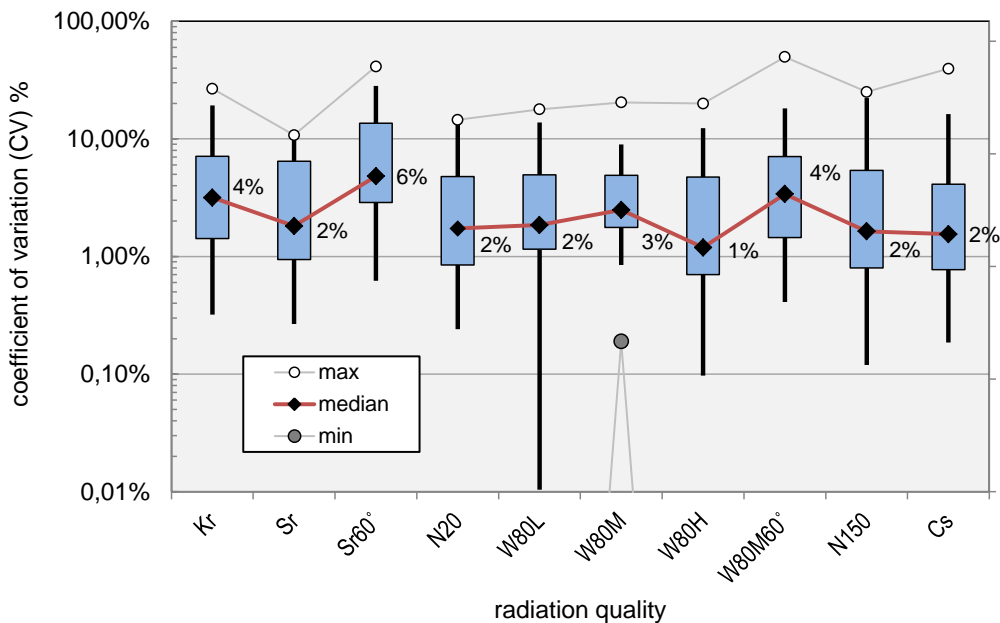


Figure 18. Distribution of all coefficients of variation (calculated from only 2 response values except for quality W80M) for all different irradiations (beta's and photons). Symbols like in Figure 10. The minimum CV is sometimes 0%. Additional distributions are given in Figure 22 (Appendix E)

### 3.8 Response values as a function of reference doses

Figure 19 displays all response values as a function of the reference dose using both a linear and a logarithmic response scale. The dashed lines represent the trumpet curves and the full lines the F-values. The outliers represent 16% of the total numbers of reported values. For the more strict F-criteria (+1.5, 1/1.5) a fraction of 19% of all values are outliers.

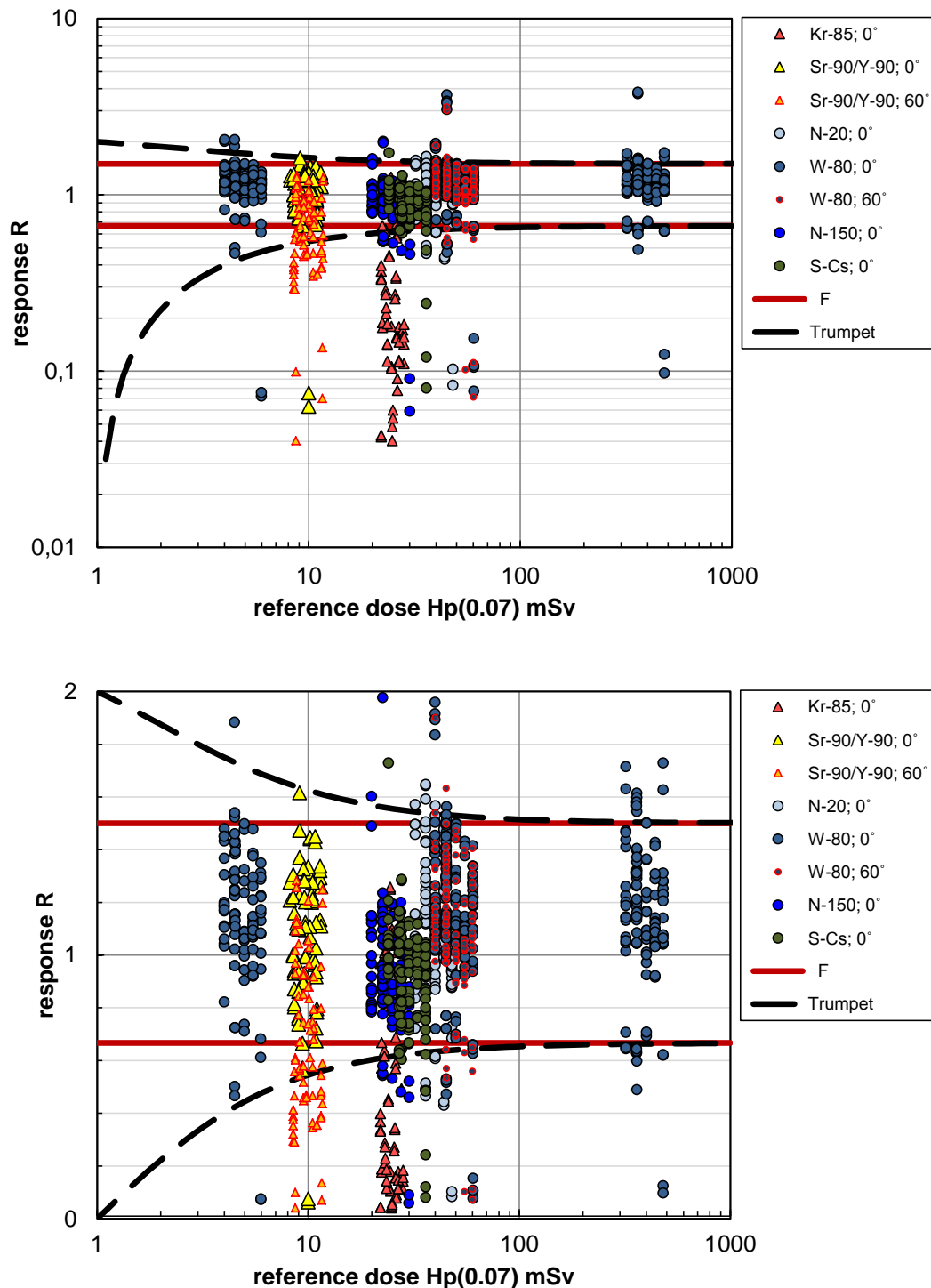


Figure 19 Response values as a function of reference dose. Above logarithmic scale; below linear scale. The dashed lines represent the trumpet curves according to equation (1), full lines the F-values, with  $F=1.5$  and  $H_0=1$  mSv. Outliers, defined as those values not falling within the trumpet curves represent 16% of the total numbers of reported values.

### 3.9 Outliers

Defining all the response values out of the trumpet curves as outliers, Table 5 represents the relative number of outliers per radiation quality and type of dosimetry system. Additional data are given in the Appendix E in Figure 23.

Table 5 a,b. Numbers and relative number of outliers for the trumpet curve criteria ( $H_0=1$  mSv and  $F = 1.5$ ) for all photon (Ph), photon- beta (PhB) and beta (B) dosimeters. The resulting beta response values and outliers were not considered for photon dosimeters (Ph) and vice versa for beta dosimeters (B).

<b>Outliers</b>	<b>Quality</b>	<b>Ph</b>	<b>PhB</b>	<b>B</b>	<b>All</b>
Beta	Kr-85; 0°	-	47	4	51
	Sr-90/Y-90; 0°	-	2	-	2
	Sr-90/Y-90; 60°	-	30	2	32
<b>Beta all</b>		<b>-</b>	<b>79</b>	<b>6</b>	<b>85</b>
Photon	N-20; 0°	6	9	-	15
	W-80; 0°	16	33	-	49
	W-80; 60°	5	7	-	12
	N-150; 0°	4	10	-	14
	S-Cs; 0°	3	5	-	8
<b>Photon all</b>		<b>34</b>	<b>64</b>	<b>-</b>	<b>98</b>
<b>All</b>		<b>34</b>	<b>143</b>	<b>6</b>	<b>183</b>

<b>Outliers</b>	<b>Quality</b>	<b>Ph</b>	<b>PhB</b>	<b>B</b>	<b>All</b>
Beta	Kr-85; 0°	-	64%	100%	65%
	Sr-90/Y-90; 0°	-	3%	-	3%
	Sr-90/Y-90; 60°	-	41%	50%	41%
<b>Beta all</b>		<b>-</b>	<b>36%</b>	<b>50%</b>	<b>36%</b>
Photon	N-20; 0°	15%	12%	-	13%
	W-80; 0°	10%	11%	-	11%
	W-80; 60°	13%	9%	-	11%
	N-150; 0°	10%	14%	-	12%
	S-Cs; 0°	8%	7%	-	7%
<b>Photon all</b>		<b>11%</b>	<b>11%</b>	<b>-</b>	<b>11%</b>
<b>All</b>		<b>11%</b>	<b>18%</b>	<b>50%</b>	<b>16%</b>

ISO 14146 allows one outlier within 10 results. Therefore the fraction of services passing these criteria is slightly higher than the values summarized in Table 5. From all photon (Ph) dosimeters, 15 systems out of 20 (75%) passed the trumpet curve criteria (for photon qualities only!). From all photon-beta (PhB) dosimeters, 14 out of 37 (38%) passed the criteria for both radiation types. One of the two beta only (B) dosimeter systems passed this test as well.

In total 30 systems out of 59 (51%) passed the trumpet curve criteria. Using the more stringent  $F=1.5$  criterion, total 28 out of 59 (47%) passed this test. It must be noted that the fraction of outliers strongly depends on the selection of radiation qualities for such an intercomparison as well as the number of dosimeters used for the different qualities.

### 3.10 Results for individual systems

This paragraph presents results for individual systems separately and in an anonymous manner. Individual systems are represented with a “system number”. This number was randomly assigned and has no relation to the participant number as used by the organizer for keeping track of correspondence etc.

Response values for each individual system separately are shown anonymously in Figure 20. It shows that most outliers are grouped at the Kr-85 and Sr-90/Y-90;60° qualities (under response), or at certain systems (over response). Some systems show a remarkable bias, other a more than normal spread of the results.

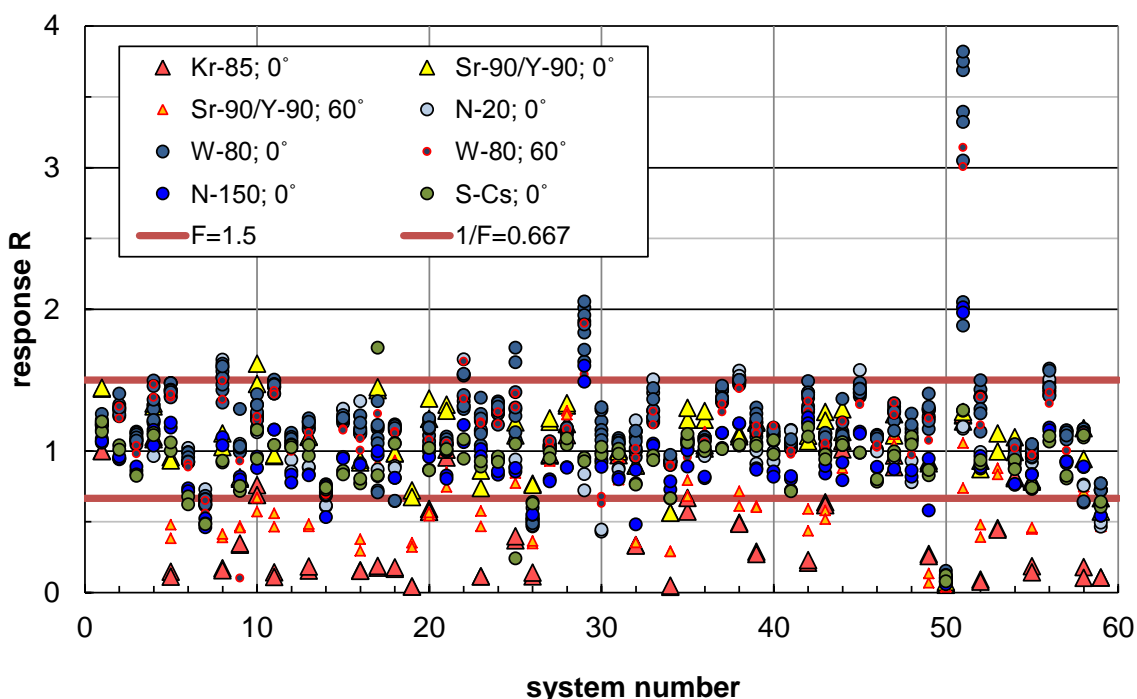


Figure 20. Response values given in the certificates for each individual participant system.

For each participating system a separate datasheet was prepared summarizing all the results and the underlying data. Each sheet shows the data reported by the irradiation laboratory and by the participant, and the response value calculated from these values, for each irradiation separately. In addition, data has been combined for the radiation qualities. Some statistical quantities are given

as well. Also, two figures have been added: one showing the response values in the trumpet curve, and one showing response values for the different radiation qualities.

These sheets have been prepared primarily to enable the participants to analyze their own results and to compare these with the results of the other participants. The individual results will not be analyzed in further detail in this report. The datasheets for all participants can be looked up in Appendix F: Datasheets with results for individual participants.

### **3.11 Non irradiated dosimeters**

The maximum dose measured with the active transit and background control dosimeters for all shipments between organiser and irradiation laboratories was 2 microsievert (maximum transfer time 2 days). The average total dose registered with these four active dosimeters, from dispatch of the dosimeters to the first laboratory (4 August 2009) until their return to the organiser (22 October 2009), amounted to  $0.110 \pm 0.007$  mSv. Therefore it can be concluded that there were no significant doses caused by possible X-ray examination of the parcels during transits between the organiser and the irradiation laboratories.

The OG did not provide guidance to the participants for reporting the results for their transit and background control dosimeters in a specific manner. Therefore, the participants choose their own approaches for reporting these results. For about half of all systems, zero values were reported for all background and transit dosimeters (in mSv, with different number of decimals). For 13 systems there was no numerical value reported (either text "ZERO", "Bkg.", indication of maximum value such as "<0.01 mSv" or "<0.1 mSv", or field left blank).

For 16 systems non-zero values were reported for the transit and background control dosimeters. Of those, the average reported dose was smaller than 0.05 mSv for six systems. For the other 10 systems with non-zero values, the average transit and control dosimeter dose ranged from 0.12 to 0.35 mSv. Since participants used their own approach to report these results, it is unclear if these are transit doses due to possible X-ray examinations during transport, or just normal background values. In any case the dose values are quite small and this supports the conclusion that there were no significant doses caused during transits.

## 4 Conclusions

EURADOS working group 2 has developed a system for self sustained intercomparison (IC) exercises for individual monitoring services for external radiation. Within this programme an IC exercise for extremity dosimeters in photon and beta radiation fields was carried out in 2009 IMS across Europe participated with 59 dosimetry systems. With the aid of the IC results the participants can show compliance within their quality management system, compare their results with those from other participants and develop action plans for improvement of their system.

In general, the IMS participants showed a very satisfactory performance with only 16% outliers from the total reported values. The median of all response values was very close to unity. This finding confirms that in general the calibration procedures, especially the traceability to standard dosimetry laboratories, works well without any general bias. However, the results show also that a number of services (especially some outliers) could improve the quality of their systems by improved calibration.

The performance of the dosimeters in very low energy beta fields and in high angle photon irradiations has shown, in general, a noticeable under-response. For the highly sensitive LiF:Mg,Cu,P the response for beta irradiations is superior to that of LiF:Mg,Ti. An obvious explanation for the observed superior beta sensitivity of the highly sensitive LiF:Mg,Cu,P based dosimeters could be the possible use of thinner detector elements, especially when combined with very thin ( $< 10 \text{ mg.cm}^{-2}$ ) filter.

The high number of IMS participants (44) with 59 different systems confirms that there is a significant demand for international ICs and it is concluded that these are of significant operational value for IMS.

## Acknowledgement

The authors would like to express their acknowledgement to the Eurados Chairperson, Helmut Schumacher, for his encouragements during the course of the IC2009 project and to the WG2 Chairperson, Joao Alves, for his support and extensive review of the report



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## Appendix A: Time schedule

Realized time schedule of IC2009:

April 2009	Announcement - Call for participants
June 2009	Deadline for IMS sending Application Forms
June 2009	Deadline for receiving guidelines
July 2009	Deadline for IMS sending dosimeters labelled
August - October 2009	Irradiation
November 2009	IMS Receiving dosimeters for readout
December 2009	Deadline for IMS sending dosimeters results
January 2010	Deadline for OG sending and confirming results from IMS
March 2010	IMS receiving Certificates of Participation at Participants Meeting (coinciding with the European Conference on Individual Monitoring, 2010)

## Appendix B: List of participants

List of participants, sorted alphabetically by country and institute

Institute	Country	Number of systems
AV-Controlatom	Belgium	1
Belgoprocess NV	Belgium	1
Controle Physique U.L.B.	Belgium	1
SCK-CEN Belgian Nuclear Research Centre	Belgium	1
U.Z. gasthuisberg Leuven	Belgium	1
CSOD - Celostatni sluzba osobni dozimetrie, s.r.o.	Czech Republic	1
VF, a.s.	Czech Republic	1
Personal Dosimetry Laboratory	Denmark	1
Doseco Ltd	Finland	1
Institute de Radioprotection et de Surete Nucleaire	France	2
HMGU-Auswertungsstelle	Germany	1
Karlsruher Institut für Technologie (KIT)	Germany	1
Landesanstalt für Personendosimetrie und Strahlenschutz Ausbildung	Germany	2
MPA Nordrhein-Westfalen	Germany	2
Strahlenmessstelle Berlin	Germany	1
Greek Atomic Energy Commission	Greece	3
IAEA, Dept. of Nucl. Safety and Security	IAEA	2
Radiological Protection Institute of Ireland (RPII)	Ireland	1
Dipartimento di Energia. Laboratorio di Radioprotezione	Italy	2
ENEA Radiation Protection Institute Dosimetry Service	Italy	2
L.B. Servizi per le Aziende s.r.l.	Italy	1
Tecnorad s.r.l.	Italy	3
X-Gammaguard di Laura Pini	Italy	2
Central Laboratory for Radiological Protection	Poland	1
Laboratory of Individual and Environmental Dosimetry (LADIS)	Poland	1
Nofer Institute of Occupational Medicine	Poland	1
ITN-DPRSN	Portugal	1

Vinca Institute of Nuclear Sciences, Radiation Protection Dpt, Individual Monitoring Service	Serbia	1
Jozef Stefan Institute	Slovenia	1
Nuclear Power Plant Krsko	Slovenia	1
Ciemat External Dosimetry Service	Spain	1
Gestisa	Spain	1
Servicio de Dosimetria Externa de la Fabrica de Juzbado	Spain	1
Universitat Politècnica de Catalunya (UPC) Institut de Tècniques Energètiques	Spain	2
Paul Scherrer Institute	Switzerland	1
NRG - Radiation & Environment - Arnhem	The Netherlands	1
NRG - Radiation & Environment - Petten	The Netherlands	1
SBD-TU/e	The Netherlands	2
VU University	The Netherlands	1
AWE Aldermaston	United Kingdom	1
Berkeley Approved Dosimetry Service	United Kingdom	1
Defence Science and Technology Laboratory	United Kingdom	1
Landauer Europe	United Kingdom	1
UK Health Protection Agency	United Kingdom	3

## Appendix C: Example irradiation certificates

<p><b>IRSN</b> INSTITUT DE RADIOPROTECTION ET DE SÛRETÉ NUCLÉAIRE</p> <p>DRPH/SDE/LDR1 BP 17 92262 Fontenay-aux-Roses CEDEX France Tél : 01.58.35.81.51 Fax : 01.47.46.97.77</p>	<p><b>Test report</b> <b>N° 2009-SXX</b></p> <p><b>Subject:</b> EURADOS comparison exercise 2009 (IC 2009) - Beta irradiation of personal extremity dosimeters in the personal dose equivalent, <math>H_p(0.07)</math>.</p> <p><b>Ordered by:</b> EURADOS intercomparison 2009 Organization Group.</p> <p><b>Participant:</b> EURADOS intercomparison dosimeter system Identification S XX</p> <p><b>Dosemeter:</b> Personal dosimeters 6 extremity dosimeters (ring) delivered by the participant with dosimeter identification between Sxx-17 to SXX-22</p> <p>This report includes 3 pages Date of issue : 2010, 02-23</p> <p>Technical manager of laboratory</p> <p>C. ITIE</p> <p><i>The certificate may be reproduced other than in full by photographic process</i></p>
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## 1 Method

The irradiations are realized in terms of personal dose equivalent,  $H_p(0.07)$  according to the International Standard ISO 6980 [1-3]. The unity of this quantity is mSv.

The calibration equipment is a "beta Secondary Standard 2" manufactured by ISOTRAK/PTB. The radioactive sources used during this comparison exercise are  $^{90}\text{Sr} + ^{90}\text{Y}$  and  $^{85}\text{Kr}$ . The traceability of this standard is defined in calibration certificates delivered by the national standard laboratory, PTB (Physikalisch-Technische Bundesanstalt), respectively:

- PTB-6.31-SR-KB436-10.2001 for  $^{90}\text{Sr} + ^{90}\text{Y}$  source.
- PTB-6.31-KR-KB396-10.2001 for  $^{85}\text{Kr}$  source.

The reference quantity is established in terms of personal dose equivalent,  $H_p(0.07)$ , calculated by the BSS2 program including the irradiation conditions.

The angular conversion coefficients used in the program and recommended by ISO Standard 6980-3 [3] are:

$$\begin{aligned} h_{p,0}(0.07; ^{85}\text{Kr}; 0^\circ) &= 1.00 \text{ Sv.Gy}^{-1} \\ h_{p,0}(0.07; ^{90}\text{Sr} + ^{90}\text{Y}; 0^\circ) &= 1.00 \text{ Sv.Gy}^{-1} \\ h_{p,0}(0.07; ^{90}\text{Sr} + ^{90}\text{Y}; 60^\circ) &= 1.14 \text{ Sv.Gy}^{-1} \end{aligned}$$

These conversion coefficients are the same for all phantoms slab, pillar and rod (see: section 4.1.2.3. of ISO 6980-3).

### Radiation field and irradiation set-up:

Each dosimeter is irradiated in the front face of the phantom according to the ISO-6980-3 standard [3]. The phantom is positioned perpendicularly to the incident beta radiation field (see "irradiation configuration" section below). Dosimeters are fixed on the phantom within  $\pm 50$  mm from the centre of the axis of the radiation field.

The irradiation configuration is as follows:

- Distance source - test point of the dosimeter: 30 cm. The reference point of the dosimeter defined by the participant is placed on the test point.
- Diameter of the fields and homogeneity: 15 cm in diameter with a factor of homogeneity of 1.
- Rotation axis: the rotation axis is parallel to the axis of the phantom and goes through the reference point of the dosimeter.
- Phantom for wrist dosimeter: ISO pillar phantom is a water-filled hollow cylinder with PMMA walls and an outer diameter of 73 mm and a length of 300 mm.
- Phantom for ring dosimeter: ISO rod phantom: cylindrical PMMA phantom with a diameter of 19 mm and a length of 300 mm.

### 3 Irradiation results

- Dates of irradiation: 16/09/2009 to 23/09/2009.
- Environmental conditions:
  - Temperature, T= 23.2 to 23.4 °C.
  - Atmospheric pressure, P= 995.4 to 1009.8 hPa.
  - Relative air humidity, H= 54 to 61 %.

Ring Dosimeter	Number	Source	Reference quantity	Personal dose equivalent rate	Time	Personal dose equivalent	Relative expand uncertainty
				mSv.h <sup>-1</sup>	s	mSv	%
Beta fields	SXX-17	<sup>90</sup> Sr- <sup>90</sup> Y	Hp(0.07;α=0)	30.3	1355.8	11.4	4.6
	SXX-18	<sup>90</sup> Sr- <sup>90</sup> Y	Hp(0.07;α=0)	30.3	1355.8	11.4	4.6
	SXX-19	<sup>90</sup> Sr- <sup>90</sup> Y	Hp(0.07;α=60)	34.4	1045.9	10	5
	SXX-20	<sup>90</sup> Sr- <sup>90</sup> Y	Hp(0.07;α=60)	34.4	1045.9	10	5
	SXX-21	<sup>85</sup> Kr	Hp(0.07;α=0)	94.7	1008	26.5	4.6
	SXX-22	<sup>85</sup> Kr	Hp(0.07;α=0)	94.7	1008	26.5	4.6

#### Uncertainty:

The budget uncertainty is calculated as the combination of each measurement uncertainty with the uncertainty due to the determination of the reference. The expanded uncertainties for personal dose equivalent are calculated with a coverage factor of two.

### 4 References

- [1] ISO-6980-1. Reference beta-particle radiation - part 1: Methods of production (2006).
- [2] ISO-6980-2. Reference beta-particle radiation - part 2: Calibration fundamentals related to basic quantities characterizing the radiation field (2005).
- [3] ISO-6980-3. Reference beta-particle radiation - part 3: Calibration of area and personal dosimeters and the determination of their response as a function of beta radiation energy and angle of incidence (2007).



## TEST REPORT LR-P0201-XX/09

**Subject:** EURADOS Intercomparison 2009 (IC2009)  
Photon irradiation of personal extremity dosimeters  
in the dose quantity personal dose equivalent  $H_p(0.07)$

**Ordered by:** EURADOS Intercomparison 2009  
Organisation Group

**Participant:** EURADOS Intercomparison 2009  
dosimeter system identification SXX

**On:** 16 passive finger ring/tip dosimeters delivered by the  
participant with dosimeter identification Sxx -01 to Sxx -16

This report contains the pages: 1 to 3

Date of issue: 03.03.2010

Technical responsibility:

Test performed by:

\_\_\_\_\_  
Dr. Hannes Stadtmann

\_\_\_\_\_  
Dr. Christian Hranitzky

**Comments:**

**This test report refers exclusively to the test subject and to the configuration of the test subject at the date of test. Subsequent changes of the test subject are not covered by this test report.  
The production or transmission of extracts of the present report is subject to authorisation by the testing laboratory.**





Seibersdorf Labor GmbH - Dosimetry  
 Test Report LR-P0201-xx/09

<b>Test report number</b>	LR-P0201-xx/09
<b>Date of delivery</b>	5 <sup>th</sup> August 2009
<b>Dosimeter numbers</b>	Assignment of the dosimeter identification numbers by the EURADOS Intercomparison organisation group (Coordinator T.W.M. Grimbergen)
<b>Irradiation protocols</b>	G-DEL-AA0015 Reference irradiation of dosimeters
<b>Calibration certificates for the used standards</b>	BEV T07-0668/2 for <sup>137</sup> Cs nuclide source Q5, BEV T09-0068/6 for x-ray radiation qualities using the monitor chamber M50E-8301
<b>Measuring quantity</b>	Personal dose equivalent $H_p(0.07)$ in Sv
<b>Radiation qualities and angles of incidence</b>	N-20, W-80, N-150, and S-Cs according to ISO 4037-1 (1996) 0° reference direction perpendicular to the dosimeter front surface 60° to the dosimeter front surface perpendicular to the phantom axis
<b>Point of test distance</b>	1000 mm
<b>Reference point</b>	at the rear side of the dosimeter at the phantom's front surface - deviations from the participant's stated reference points were considered in the uncertainty
<b>Phantom</b>	ISO rod phantom: cylindrical PMMA phantom with a diameter of 19 mm and a length of 300 mm
<b>Ambient conditions</b>	Atmospheric pressure: 993 hPa - 998 hPa Temperature: 21.4 °C – 22.1 °C Relative air humidity: 62 % – 71 %
<b>Irradiation date</b>	August 2009, see table of results
<b>Storage</b>	between 5 <sup>th</sup> of August (date of arrival) and 31 <sup>st</sup> of August (date of dispatch) all dosimeters were stored together at controlled laboratory conditions partly in a lead container

#### Radiation field and Irradiation Set-up

The dosimeters were irradiated on the front surface of the phantom according to ISO 4037 standard. The irradiations were performed in the continuous radiation field of a Philips MG320 x-ray facility and a collimated-beam nuclide source facility of the Dosimetry Laboratory Seibersdorf. The phantom was positioned perpendicular to the main beam axis at a distance of 1000 mm from the source/focus to the phantom's front surface. The beam diameter was 160 mm and 260 mm for the x-ray radiation and for the <sup>137</sup>Cs gamma radiation, respectively. Dosimeters were fixed on the phantom within ± 40 mm from the central beam axis within their holder or with adhesive tape according to the participant's specifications. Field inhomogeneity was considered in the uncertainty budget. The influence of simultaneous irradiation of 4 dosimeters was not taken into account. For S-Cs irradiations a 2 mm PMMA build-up plate was positioned about 50 mm in front of the dosimeters.

Page 2 of 3

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 www.seibersdorf-laboratories.at | Landesgericht Wiener Neustadt | FN 319187y | DVR: 4000738 | UID: ATU64787504 | Steuernummer: 153/571 | Zertifiziert nach ISO 9001:2008  
 Bankverbindung: Erste Bank der Österreichischen Sparkassen AG | BLZ 20111 | Konto Nr. 291-140-380/00 | IBAN AT112011291140380000 | BIC GIBAATWW

Seibersdorf Labor GmbH - Dosimetry  
Test Report LR-P0201-xx/09

### Dose Determination

$$H_p(0,07) = K_a \cdot h_{pK}(0,07)$$

The personal dose equivalent  $H_p(0.07)$  was calculated by applying the corresponding ISO 4037-3 (1999) conversion coefficient  $h_{pK}$  to the reference air kerma free air value  $K_a$ . For dose equivalent values above 320 mSv (W-80) air kerma was determined by the average measured air kerma rate times the irradiation time. Conversion coefficients for S-Cs were taken from ISO 12794 (2000) for  $^{137}\text{Cs}$  photon energy based on the publication of B. Grosswendt, Radiat. Prot. Dosim. 59 (1995).

### Irradiation Results

Resulting dose equivalent values and related uncertainties for the 16 dosimeters of the participant's dosimeter system are given in the following table. Irradiation times were between 100 s and 1300 s, average air kerma rates were between 100 mGy/h and 1200 mGy/h.

dosemeter	irradiation date	radiation quality	angle of radiation incidence	conversion coefficient $h_{pK}$ (Sv/Gy)	$H_p(0,07)$ (mSv)	expanded uncertainty (k=2)
Sxx-01	11.08.2009	W-80	0°	1.13	4.00	4,5 %
Sxx-02	11.08.2009	W-80	0°	1.13	4.00	4,5 %
Sxx-03	12.08.2009	W-80	0°	1.13	39.9	4,5 %
Sxx-04	12.08.2009	W-80	0°	1.13	39.9	4,5 %
Sxx-05	12.08.2009	W-80	0°	1.13	39.9	4,5 %
Sxx-06	12.08.2009	W-80	0°	1.13	39.9	4,5 %
Sxx-07	12.08.2009	W-80	+60°	1.13	40.0	5 %
Sxx-08	12.08.2009	W-80	-60°	1.13	40.0	5 %
Sxx-09	13.08.2009	W-80	0°	1.13	320	4,5 %
Sxx-10	13.08.2009	W-80	0°	1.13	320	4,5 %
Sxx-11	14.08.2009	N-20	0°	0.98	32.1	4,5 %
Sxx-12	14.08.2009	N-20	0°	0.98	32.1	4,5 %
Sxx-13	11.08.2009	N-150	0°	1.17	20.0	5 %
Sxx-14	11.08.2009	N-150	0°	1.17	20.0	5 %
Sxx-15	10.08.2009	S-Cs	0°	1.12	24.0	5 %
Sxx-16	10.08.2009	S-Cs	0°	1.12	24.0	5 %

### Uncertainty

The uncertainty of the dose equivalent values mainly depends on the uncertainty of the conversion coefficients. The reported expanded uncertainty is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k = 2$  which for a normal distribution corresponds to a coverage probability of approximately 95 %. The standard uncertainty of measurement has been determined in accordance with EA Publication EA 4/02 (1999).

Page 3 of 3

## Appendix D: Example "Certificate of Participation"

European Radiation Dosimetry Group		
<small>European Radiation Dosimetry Group e.V. • Bundesallee 100 • D-38116 Braunschweig</small>		<small>Certificate of Participation Eurados-2009-Sxx</small>
<b>Certificate of Participation</b>		
for the Eurados 2009 Intercomparison for extremity dosimeters		
<b>Certificate number:</b>	Eurados-2009-Sxx	
<b>Number of pages:</b>	2	
<b>Date of Issue:</b>	9 March 2010	
<b>Participating institute:</b>	<i>example certificate</i>	
<b>Dosimetry system:</b>	<i>example certificate</i>	
<b>Intercomparison procedure:</b>	<p>The EURADOS 2009 Intercomparison for extremity dosimeters was managed and <del>co-</del><u>ordinated</u> on behalf of EURADOS by the WG2 Intercomparison Organization Group (OG). The OG established the irradiation plan, and announced the intercomparison, including the range limits of the doses and radiation qualities, in April 2009.</p> <p>On the application form candidate participants were asked to indicate details of the dosimeter reference point, and types of irradiation to be included on the certificate of participation (photons, betas or both). After completing subscription procedures the participant sent its dosimeters, according to the instructions of the OG to the OG Coordinator (July 2009). The Coordinator relabeled the dosimeters according to the table given on page 2, and sent all dosimeters, along with the details of the dosimeter reference point, to the first irradiating laboratory. The first irradiating laboratory irradiated the dosimeters according to their part of the irradiation plan and then sent all dosimeters to the second irradiating laboratory. The second irradiation laboratory irradiated the dosimeters according to their part of the irradiation plan and then sent them back to the Coordinator (October 2009).</p> <p>The Coordinator then returned the dosimeters to the participant for assessment and indicated which dosimeters were not irradiated. The participant was instructed to follow normal routine procedures as much as possible. The participant then sent the results of the dosimeter readings to the Coordinator (December 2009). <u>After receipt of the participant results</u>, the Coordinator sent the irradiation data to the participant.</p>	
<b>Irradiation data:</b>	See certificate of the irradiation laboratories (attached to this certificate): IRSN Test Report N°: 2009-Sxx <u>Seibersdorf</u> Laboratories Test Report LR-P-0201-xx/09	
<b>Participant results:</b>	See attached report of the participant	
<b>Intercomparison results:</b>	See the table on page 2 of this certificate	
On behalf of the intercomparison Organization Group:		On behalf of Eurados:
Tom Grimbergen Coordinator		Helmut Schumacher Chairperson
<small>Page 1 of 2</small>		

## Participants result of the intercomparison:

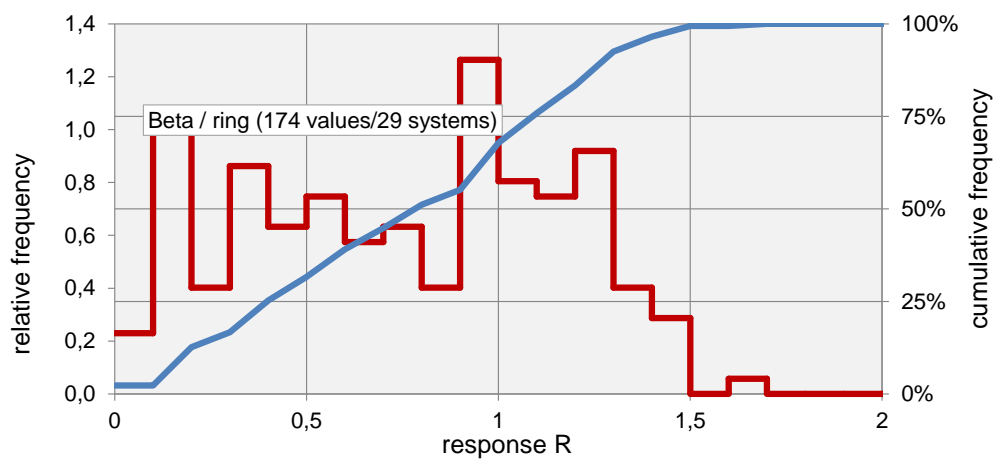
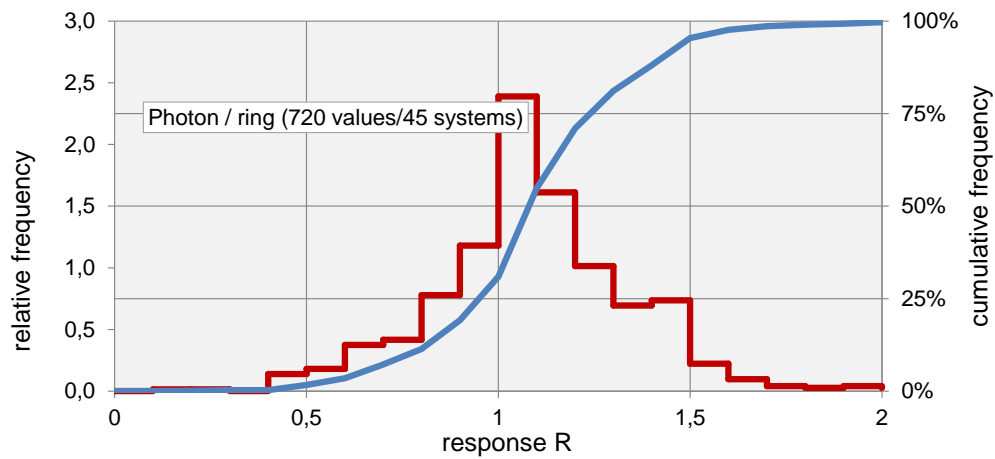
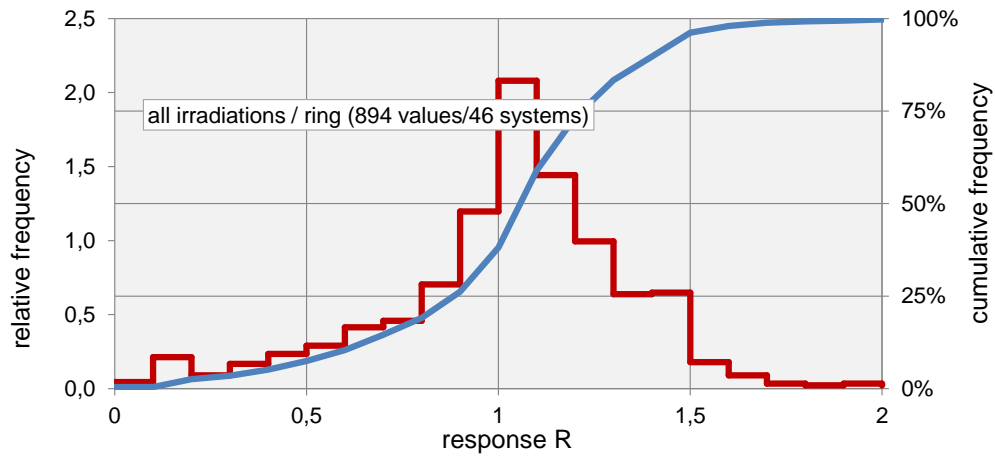
Dosemeter id organization	Dosemeter id participant	Quality	Hp(0.07)		
			Participant's value (mSv)	Reference value (mSv)	Ratio
1 Sxx-21	example certificate	Kr-85; 0°	28.367	26.5	1.07
2 Sxx-22		Kr-85; 0°	26.756	26.5	1.01
3 Sxx-17		Sr-90/Y-90; 0°	14.737	11.4	1.29
4 Sxx-18		Sr-90/Y-90; 0°	12.919	11.4	1.13
5 Sxx-19		Sr-90/Y-90; 60°	12.063	10	1.21
6 Sxx-20		Sr-90/Y-90; 60°	8.791	10	0.88
7 Sxx-11		N-20; 0°	33.444	32.1	1.04
8 Sxx-12		N-20; 0°	36.421	32.1	1.13
9 Sxx-01		W-80; 0°	5.469	4	1.37
10 Sxx-02		W-80; 0°	4.245	4	1.06
11 Sxx-03		W-80; 0°	44.164	39.9	1.11
12 Sxx-04		W-80; 0°	44.672	39.9	1.12
13 Sxx-05		W-80; 0°	44.129	39.9	1.11
14 Sxx-06		W-80; 0°	41.663	39.9	1.04
15 Sxx-07		W-80; 60°	42.255	40	1.06
16 Sxx-08		W-80; 60°	49.406	40	1.21
17 Sxx-09		W-80; 0°	384.464	320	1.20
18 Sxx-10		W-80; 0°	334.963	320	1.05
19 Sxx-13		N-150; 0°	18.355	20	0.92
20 Sxx-14		N-150; 0°	15.857	20	0.79
21 Sxx-15		S-Cs; 0°	25.473	24	1.06
22 Sxx-16		S-Cs; 0°	24.971	24	1.04
23 Sxx-23		NIR	-0.040		
24 Sxx-24		NIR	0.034		
25 Sxx-25		NIR	0.050		
26 Sxx-26		NIR	0.001		
27 Sxx-27		NIR	0.053		
28 Sxx-28		NIR	0.022		

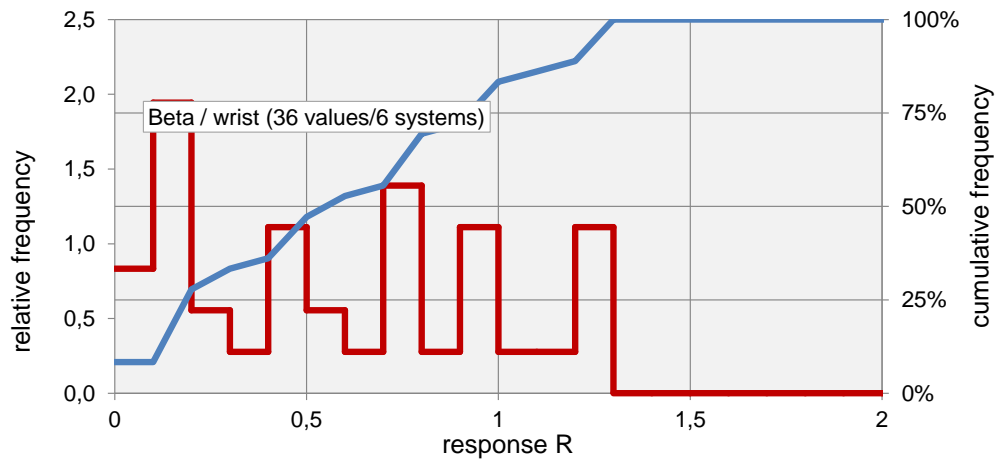
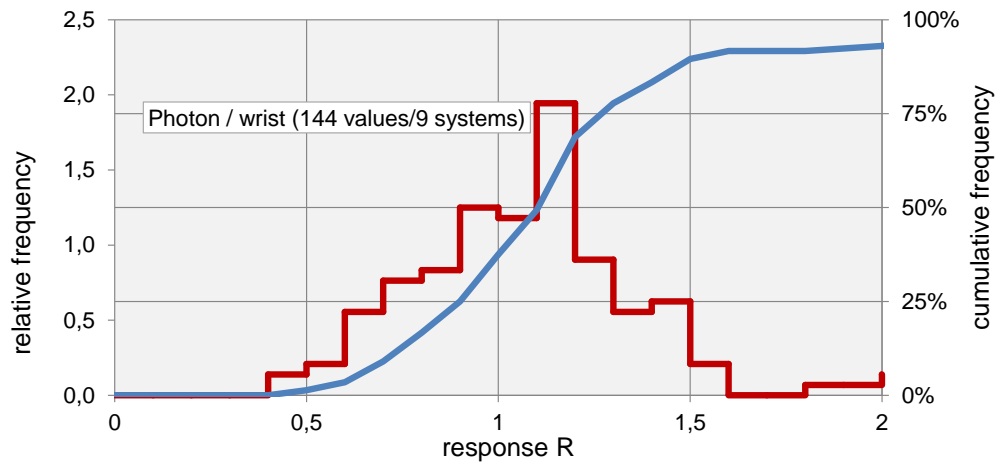
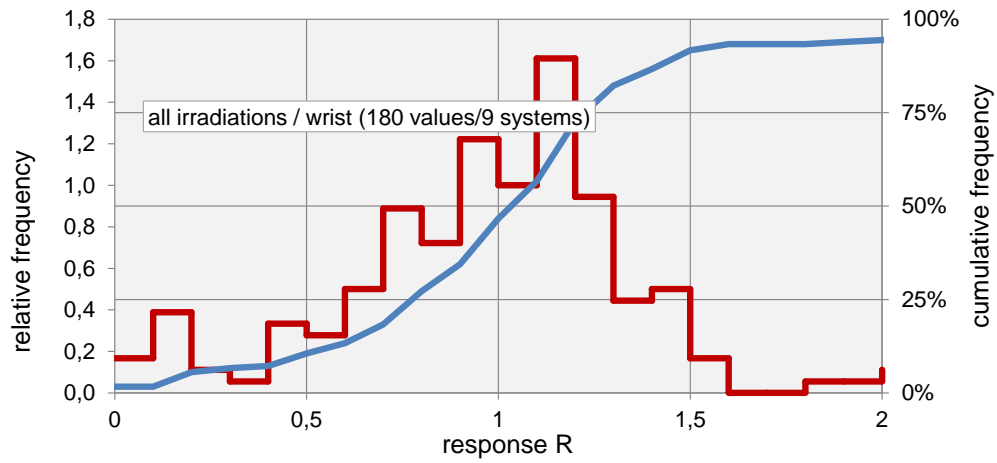
## Notes:

NIR: Not Irradiated

WIR: Wrong Irradiated

## Appendix E: Additional Diagrams





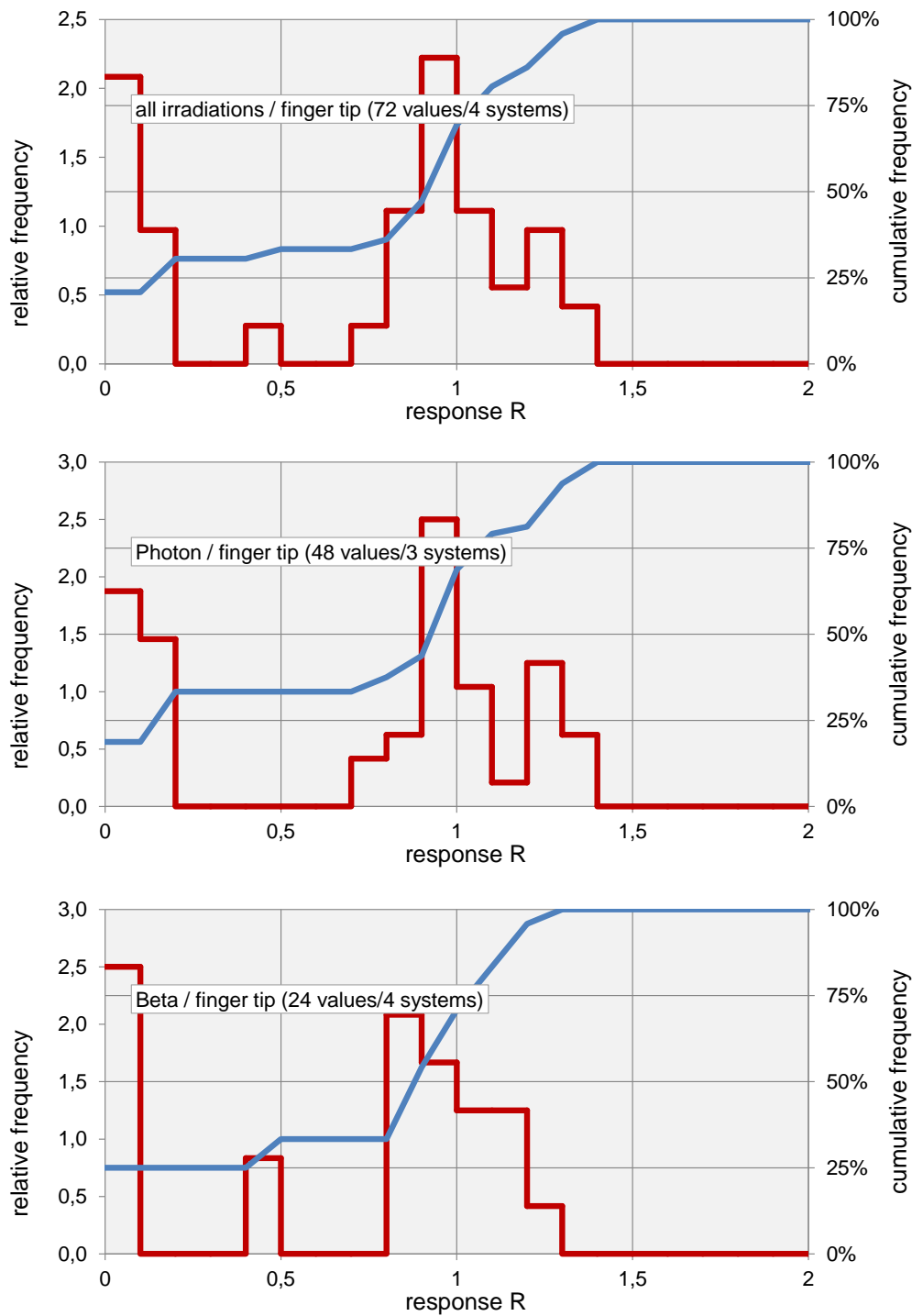


Figure 21 a - i: Frequency distributions and the cumulative distributions of the response values subdivided per hanger and radiation type. Some values were out of the range of the x-axis.

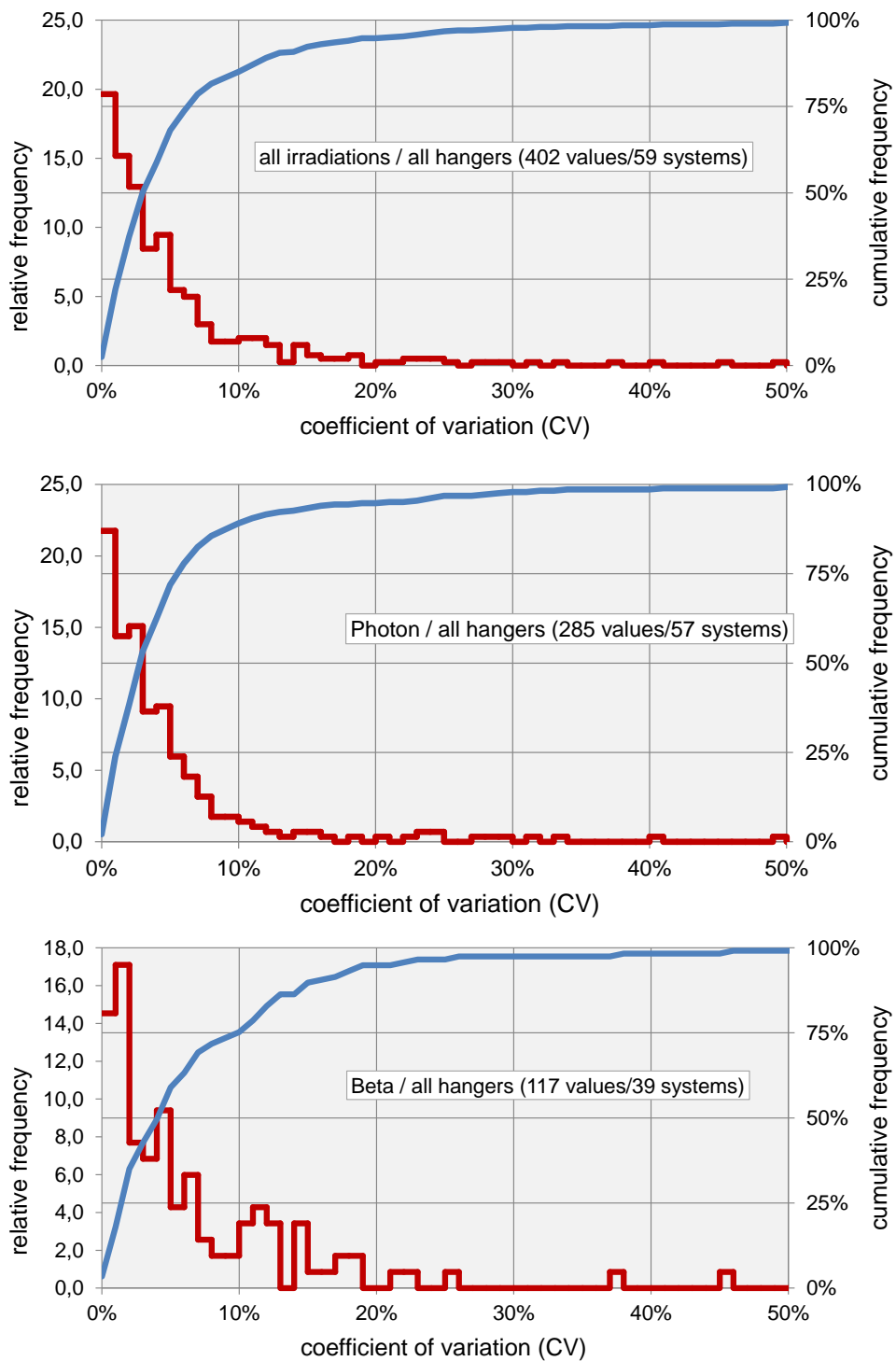


Figure 22 a, b, c.: Distribution of all coefficients of variation (calculated from only 2 response values except for quality W80M) for all different irradiations (beta's and photons). Symbols like in Figure 1. The minimum CV is sometimes 0%.



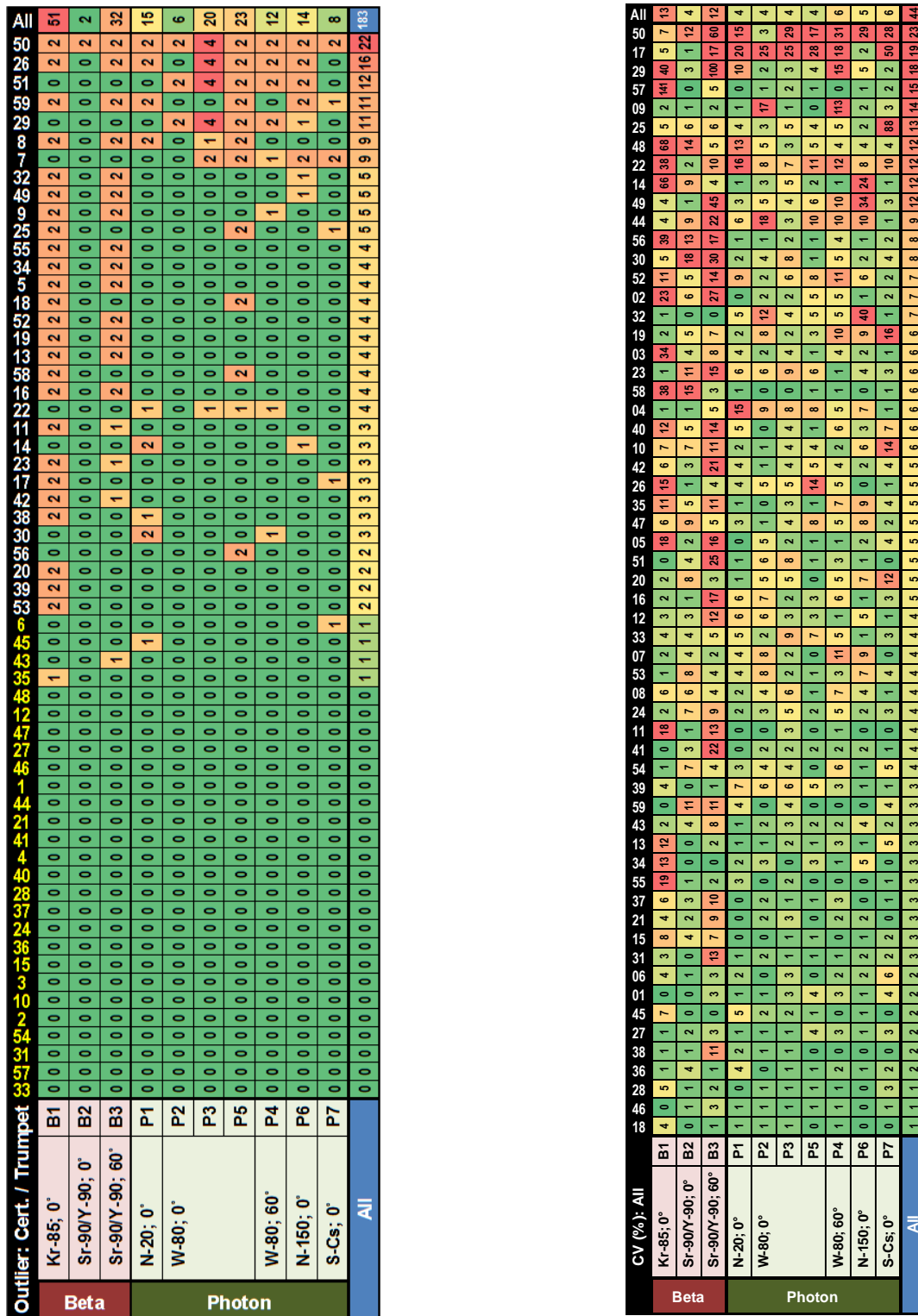


Figure 23. Left: Table of number of outliers. Right: Table of all coefficients of variation CV in % for all different irradiations and systems. The color green means small numbers and red means high numbers, yellow is in between.

## Appendix F: Datasheets with results for individual participants

In this annex all individual results are given for all participating systems. Grey lines (e.g. Beta irradiation results for a photon dosimeter) were not stated in the certificates and were not considered in the final resulting number of outliers.

The following additional identifiers were used in the annex:

- NIR not irradiated dosimeter (available for background and transport dose correction by the monitoring service)
- WIR wrongly irradiated dosimeter (wrongly irradiated by the irradiating laboratory). These results were not considered.

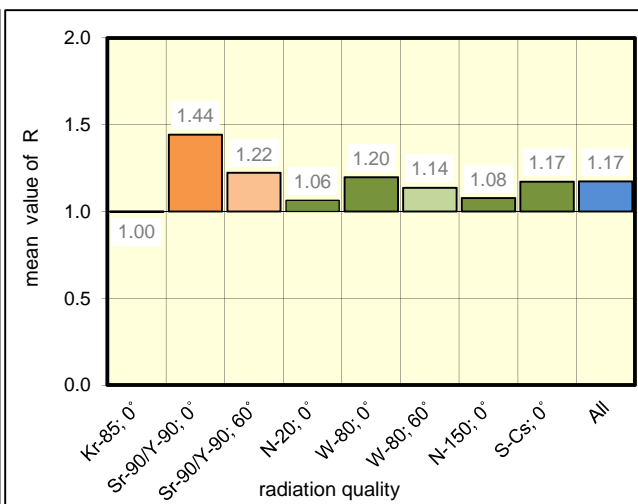
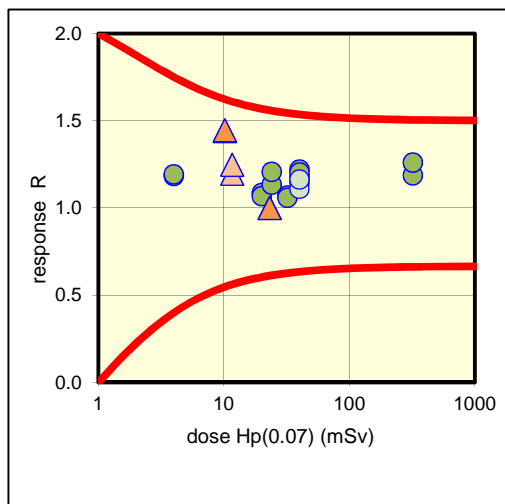
## system 1 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result		
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)		
Beta	Kr-85; 0°	21	23.20	23.19	<b>1.00</b>	OK	
		22	23.20	23.18	<b>1.00</b>	OK	
	Sr-90/Y-90; 0°	17	10.20	14.69	<b>1.44</b>	OK	
		18	10.20	14.75	<b>1.45</b>	OK	
		19	11.70	14.00	<b>1.20</b>	OK	
Sr-90/Y-90; 60°	20	11.70	14.60	<b>1.25</b>	OK		
	N-20; 0°	11	32.10	34.37	<b>1.07</b>	OK	
12		32.10	33.98	<b>1.06</b>	OK		
Photon	W-80; 0°	01	4.00	4.73	<b>1.18</b>	OK	
		02	4.00	4.77	<b>1.19</b>	OK	
		03	40.10	46.07	<b>1.15</b>	OK	
		04	40.10	48.89	<b>1.22</b>	OK	
		05	40.10	47.20	<b>1.18</b>	OK	
		06	40.10	48.28	<b>1.20</b>	OK	
		09	320.00	380.07	<b>1.19</b>	OK	
		10	320.00	403.31	<b>1.26</b>	OK	
		W-80; 60°	07	40.00	44.40	<b>1.11</b>	OK
			08	40.00	46.53	<b>1.16</b>	OK
	N-150; 0°	13	20.00	21.71	<b>1.09</b>	OK	
		14	20.00	21.36	<b>1.07</b>	OK	
	S-Cs; 0°	15	24.00	27.23	<b>1.13</b>	OK	
16		24.00	28.97	<b>1.21</b>	OK		
	NIR	23		0.00			
	NIR	24		0.00			
	NIR	25		0.00			
	NIR	26		0.00			
	NIR	27		0.00			
	NIR	28		0.00			

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	1.00	1.00	1.00	1.00	0%
Sr-90/Y-90; 0°	2	1.44	1.44	1.45	1.44	0%
Sr-90/Y-90; 60°	2	1.22	1.22	1.25	1.20	3%
Beta all	<b>6</b>	<b>1.22</b>	<b>1.22</b>	<b>1.45</b>	<b>1.00</b>	<b>16%</b>
N-20; 0°	2	1.06	1.06	1.07	1.06	1%
W-80; 0°	8	1.19	1.20	1.26	1.15	3%
W-80; 60°	2	1.14	1.14	1.16	1.11	3%
N-150; 0°	2	1.08	1.08	1.09	1.07	1%
S-Cs; 0°	2	1.17	1.17	1.21	1.13	4%
Photon all	<b>16</b>	<b>1.17</b>	<b>1.15</b>	<b>1.26</b>	<b>1.06</b>	<b>5%</b>
All	<b>22</b>	<b>1.18</b>	<b>1.17</b>	<b>1.45</b>	<b>1.00</b>	<b>10%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

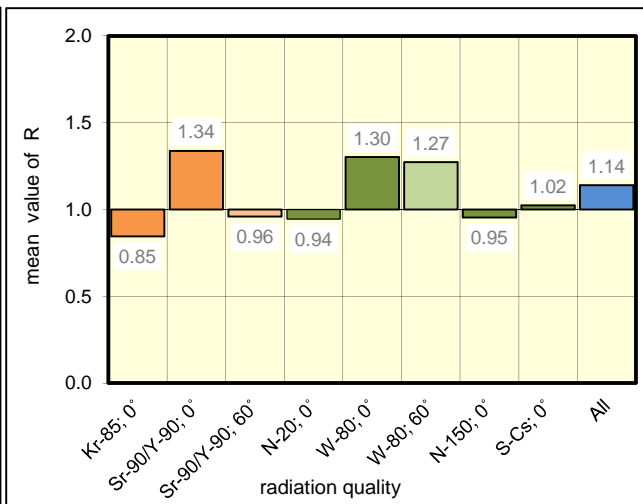
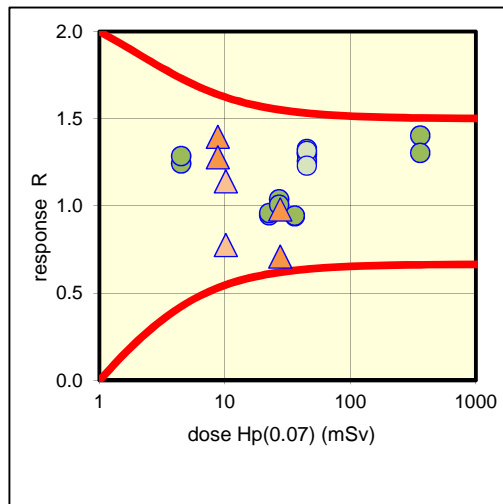
## system 2 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	27.70	19.68	0.71	(OK)
		22	27.70	27.16	0.98	(OK)
	Sr-90/Y-90; 0°	17	8.80	12.29	1.40	(OK)
		18	8.80	11.25	1.28	(OK)
		19	10.20	7.92	0.78	(OK)
Sr-90/Y-90; 60°	20	10.20	11.64	1.14	(OK)	
	N-20; 0°	11	36.00	33.90	<b>0.94</b>	OK
Photon		W-80; 0°	12	36.00	34.05	<b>0.95</b>
	01		4.48	5.57	<b>1.24</b>	OK
	02		4.48	5.76	<b>1.29</b>	OK
	03		45.10	59.81	<b>1.33</b>	OK
	04		45.10	58.46	<b>1.30</b>	OK
	05		45.10	58.85	<b>1.30</b>	OK
	06		45.10	56.67	<b>1.26</b>	OK
	09		361.00	506.83	<b>1.40</b>	OK
	10		361.00	470.60	<b>1.30</b>	OK
	W-80; 60°		07	45.10	59.30	<b>1.31</b>
08		45.10	55.50	<b>1.23</b>	OK	
N-150; 0°	13	22.50	21.32	<b>0.95</b>	OK	
	14	22.50	21.58	<b>0.96</b>	OK	
S-Cs; 0°	15	27.00	28.05	<b>1.04</b>	OK	
	16	27.00	27.21	<b>1.01</b>	OK	
	NIR	23		0.23		
	NIR	24		0.22		
	NIR	25		0.24		
	NIR	26		0.22		
	NIR	27		0.32		
	NIR	28		0.26		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.85	0.85	0.98	0.71	23%
Sr-90/Y-90; 0°	2	1.34	1.34	1.40	1.28	6%
Sr-90/Y-90; 60°	2	0.96	0.96	1.14	0.78	27%
Beta all	6	1.06	1.05	1.40	0.71	26%
N-20; 0°	2	0.94	0.94	0.95	0.94	0%
W-80; 0°	8	1.30	1.30	1.40	1.24	4%
W-80; 60°	2	1.27	1.27	1.31	1.23	5%
N-150; 0°	2	0.95	0.95	0.96	0.95	1%
S-Cs; 0°	2	1.02	1.02	1.04	1.01	2%
Photon all	16	1.25	1.18	1.40	0.94	14%
All	22	1.24	1.14	1.40	0.71	18%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

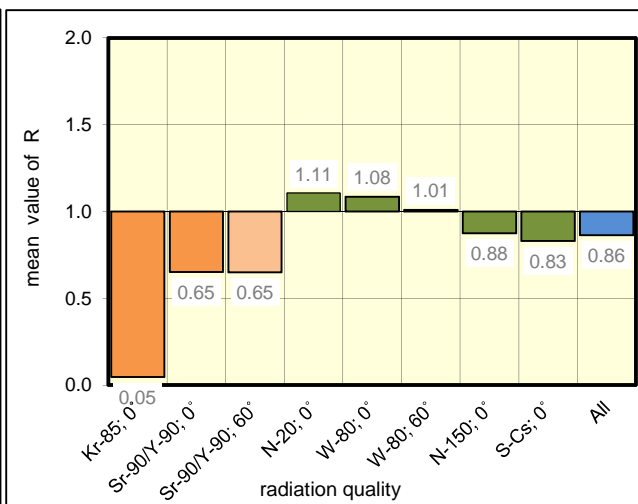
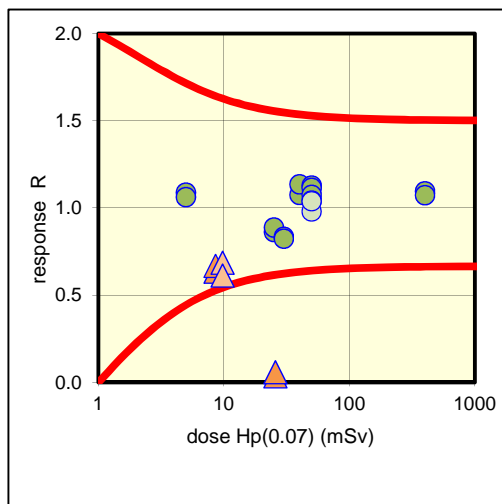
## system 3 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	25.80	0.919	0.04	(outlier)
		22	25.80	1.50	0.06	(outlier)
	Sr-90/Y-90; 0°	17	8.60	5.46	0.63	(OK)
		18	8.60	5.75	0.67	(OK)
		19	9.80	6.7	0.69	(OK)
Sr-90/Y-90; 60°	20	9.80	6.01	0.61	(OK)	
	Photon	N-20; 0°	11	40.00	43.0	<b>1.08</b>
12			40.00	45.4	<b>1.14</b>	OK
W-80; 0°		01	4.98	5.42	<b>1.09</b>	OK
		02	4.98	5.29	<b>1.06</b>	OK
		03	50.10	56.5	<b>1.13</b>	OK
		04	50.10	55.9	<b>1.12</b>	OK
		05	50.10	53.8	<b>1.07</b>	OK
		06	50.10	52.2	<b>1.04</b>	OK
		09	400.00	438	<b>1.09</b>	OK
10		400.00	429	<b>1.07</b>	OK	
W-80; 60°		07	50.10	49.1	<b>0.98</b>	OK
	08	50.10	52.0	<b>1.04</b>	OK	
N-150; 0°	13	25.00	21.5	<b>0.86</b>	OK	
	14	25.00	22.2	<b>0.89</b>	OK	
S-Cs; 0°	15	30.00	25.1	<b>0.84</b>	OK	
	16	30.00	24.7	<b>0.82</b>	OK	
	NIR	23				
	NIR	24				
	NIR	25				
	NIR	26				
	NIR	27				
	NIR	28				

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.05	0.05	0.06	0.04	34%
Sr-90/Y-90; 0°	2	0.65	0.65	0.67	0.63	4%
Sr-90/Y-90; 60°	2	0.65	0.65	0.69	0.61	8%
Beta all	6	0.62	0.45	0.69	0.04	70%
N-20; 0°	2	1.11	1.11	1.14	1.08	4%
W-80; 0°	8	1.08	1.08	1.13	1.04	3%
W-80; 60°	2	1.01	1.01	1.04	0.98	4%
N-150; 0°	2	0.88	0.88	0.89	0.86	2%
S-Cs; 0°	2	0.83	0.83	0.84	0.82	1%
Photon all	16	1.07	1.02	1.14	0.82	11%
All	22	1.01	0.86	1.14	0.04	36%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

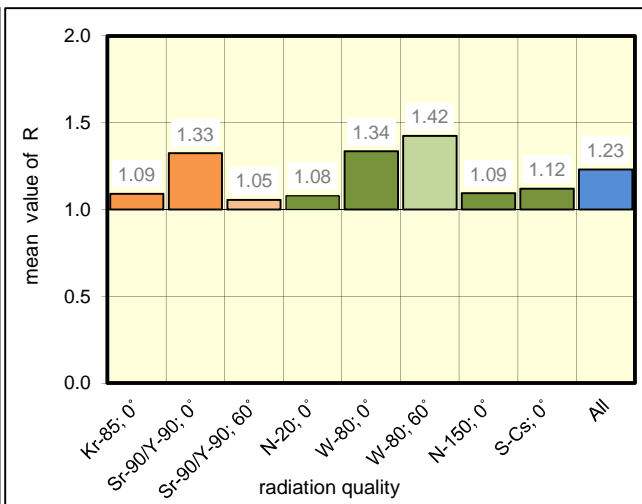
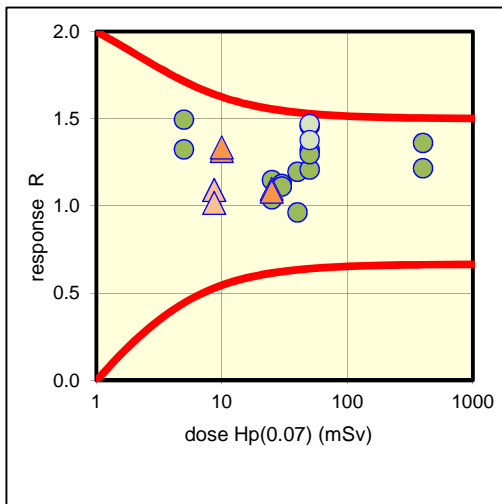
## system 4 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	25.00	27.45	<b>1.10</b>	OK
		22	25.00	27.05	<b>1.08</b>	OK
	Sr-90/Y-90; 0°	23	10.00	13.15	<b>1.32</b>	OK
		24	10.00	13.35	<b>1.34</b>	OK
	Sr-90/Y-90; 60°	19	8.70	9.50	<b>1.09</b>	OK
		20	8.70	8.85	<b>1.02</b>	OK
Photon	N-20; 0°	11	40.00	47.85	<b>1.20</b>	OK
		12	40.00	38.50	<b>0.96</b>	OK
	W-80; 0°	01	4.98	6.60	<b>1.33</b>	OK
		02	4.98	7.45	<b>1.50</b>	OK
		03	50.10	60.60	<b>1.21</b>	OK
		04	50.10	66.20	<b>1.32</b>	OK
		05	50.10	64.95	<b>1.30</b>	OK
		06	50.10	73.05	<b>1.46</b>	OK
		09	400.00	544.6	<b>1.36</b>	OK
		10	400.00	486.75	<b>1.22</b>	OK
	W-80; 60°	07	50.10	73.65	<b>1.47</b>	OK
		08	50.10	69.05	<b>1.38</b>	OK
	N-150; 0°	13	25.00	25.95	<b>1.04</b>	OK
14		25.00	28.70	<b>1.15</b>	OK	
S-Cs; 0°	15	30.00	33.80	<b>1.13</b>	OK	
	16	30.00	33.35	<b>1.11</b>	OK	
	NIR	25		0.05		
	NIR	26		0.05		
	NIR	27		0.05		
	NIR	28		0.05		
	WIR	17		13.65		
WIR	18		14.75			

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	1.09	1.09	1.10	1.08	1%
Sr-90/Y-90; 0°	2	1.33	1.33	1.34	1.32	1%
Sr-90/Y-90; 60°	2	1.05	1.05	1.09	1.02	5%
Beta all	<b>6</b>	<b>1.09</b>	<b>1.16</b>	<b>1.34</b>	<b>1.02</b>	<b>12%</b>
N-20; 0°	2	1.08	1.08	1.20	0.96	15%
W-80; 0°	8	1.32	1.34	1.50	1.21	8%
W-80; 60°	2	1.42	1.42	1.47	1.38	5%
N-150; 0°	2	1.09	1.09	1.15	1.04	7%
S-Cs; 0°	2	1.12	1.12	1.13	1.11	1%
Photon all	<b>16</b>	<b>1.26</b>	<b>1.26</b>	<b>1.50</b>	<b>0.96</b>	<b>13%</b>
All	<b>22</b>	<b>1.21</b>	<b>1.23</b>	<b>1.50</b>	<b>0.96</b>	<b>13%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

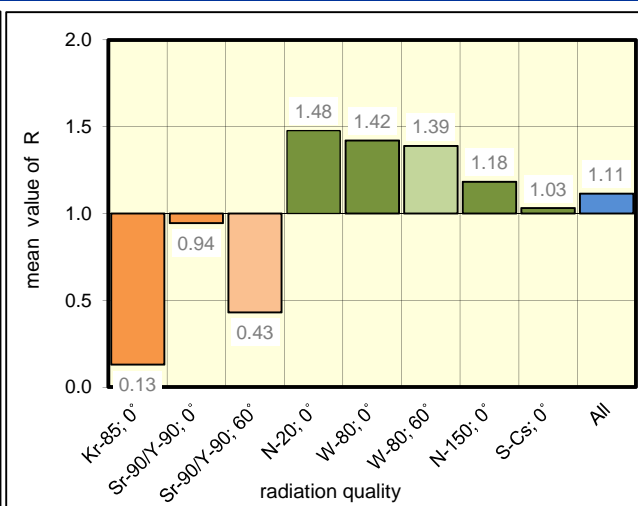
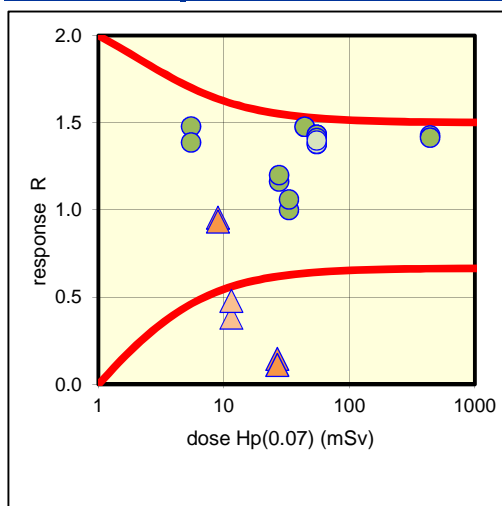
## system 5 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.70	3.9	<b>0.15</b>	outlier
		22	26.70	3.0	<b>0.11</b>	outlier
	Sr-90/Y-90; 0°	17	9.00	8.6	<b>0.96</b>	OK
		18	9.00	8.4	<b>0.93</b>	OK
		19	11.50	4.4	<b>0.38</b>	outlier
Sr-90/Y-90; 60°	20	11.50	5.5	<b>0.48</b>	outlier	
	Photon	N-20; 0°	11	44.00	65	<b>1.48</b>
12			44.00	65	<b>1.48</b>	OK
W-80; 0°		01	5.48	8.1	<b>1.48</b>	OK
		02	5.48	7.6	<b>1.39</b>	OK
		03	55.20	79	<b>1.43</b>	OK
		04	55.20	76	<b>1.38</b>	OK
		05	55.20	79	<b>1.43</b>	OK
		06	55.20	78	<b>1.41</b>	OK
		09	440.00	628	<b>1.43</b>	OK
		10	440.00	622	<b>1.41</b>	OK
W-80; 60°		07	55.10	76	<b>1.38</b>	OK
		08	55.10	77	<b>1.40</b>	OK
N-150; 0°		13	27.50	32	<b>1.16</b>	OK
		14	27.50	33	<b>1.20</b>	OK
S-Cs; 0°		15	33.00	33	<b>1.00</b>	OK
	16	33.00	35	<b>1.06</b>	OK	
	NIR	23		Bkg.		
	NIR	24		Bkg.		
	NIR	25		Bkg.		
	NIR	26		Bkg.		
	NIR	27		Bkg.		
	NIR	28		Bkg.		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.13	0.13	0.15	0.11	18%
Sr-90/Y-90; 0°	2	0.94	0.94	0.96	0.93	2%
Sr-90/Y-90; 60°	2	0.43	0.43	0.48	0.38	16%
<b>Beta all</b>	<b>6</b>	<b>0.43</b>	<b>0.50</b>	<b>0.96</b>	<b>0.11</b>	<b>74%</b>
N-20; 0°	2	1.48	1.48	1.48	1.48	0%
W-80; 0°	8	1.42	1.42	1.48	1.38	2%
W-80; 60°	2	1.39	1.39	1.40	1.38	1%
N-150; 0°	2	1.18	1.18	1.20	1.16	2%
S-Cs; 0°	2	1.03	1.03	1.06	1.00	4%
<b>Photon all</b>	<b>16</b>	<b>1.41</b>	<b>1.34</b>	<b>1.48</b>	<b>1.00</b>	<b>11%</b>
<b>All</b>	<b>22</b>	<b>1.38</b>	<b>1.11</b>	<b>1.48</b>	<b>0.11</b>	<b>40%</b>

outliers: 4 of 22

fraction of outliers: 18%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

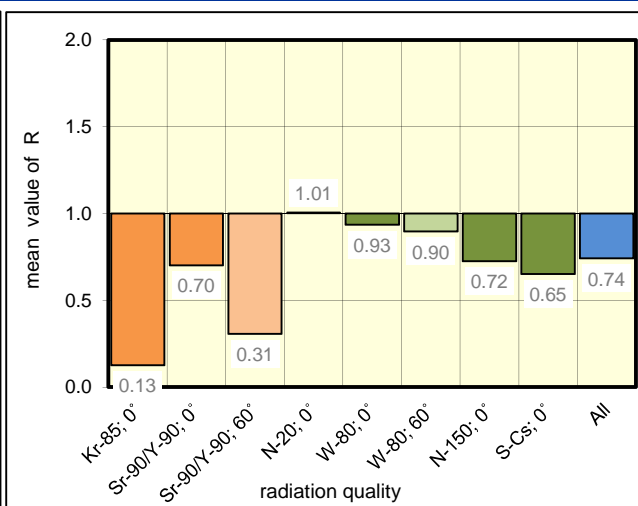
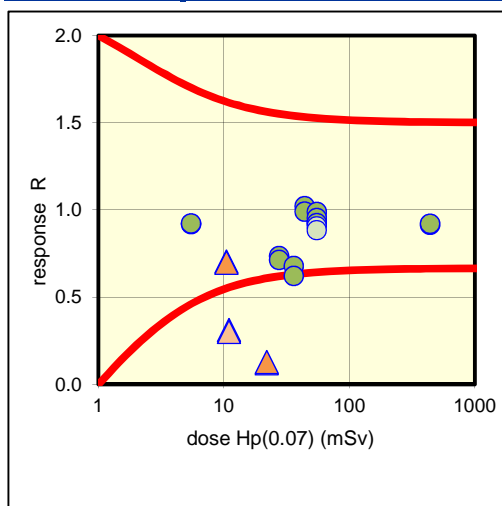
## system 6 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.00	2.68625	0.12	(outlier)
		22	22.00	2.83045	0.13	(outlier)
	Sr-90/Y-90; 0°	17	10.50	7.39385	0.70	(OK)
		18	10.50	7.32845	0.70	(OK)
	Sr-90/Y-90; 60°	19	11.00	3.42925	0.31	(outlier)
20		11.00	3.30945	0.30	(outlier)	
Photon	N-20; 0°	11	44.00	44.93415	<b>1.02</b>	OK
		12	44.00	43.62115	<b>0.99</b>	OK
	W-80; 0°	01	5.48	5.04145	<b>0.92</b>	OK
		02	5.48	5.05935	<b>0.92</b>	OK
		03	55.20	54.57415	<b>0.99</b>	OK
		04	55.20	51.14315	<b>0.93</b>	OK
		05	55.20	52.70315	<b>0.95</b>	OK
		06	55.20	51.03015	<b>0.92</b>	OK
		09	440.00	402.93515	<b>0.92</b>	OK
		10	440.00	405.59515	<b>0.92</b>	OK
	W-80; 60°	07	55.10	49.97015	<b>0.91</b>	OK
		08	55.10	48.73915	<b>0.88</b>	OK
	N-150; 0°	13	27.50	20.22315	<b>0.74</b>	OK
		14	27.50	19.64815	<b>0.71</b>	OK
	S-Cs; 0°	15	36.00	24.43815	<b>0.68</b>	OK
		16	36.00	22.42715	<b>0.62</b>	outlier
NIR	NIR	23		0.22587		
	NIR	24		0.22631		
	NIR	25		0.21863		
	NIR	26		0.22883		
	NIR	27		0.23200		
	NIR	28		0.21745		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.13	0.13	0.13	0.12	4%
Sr-90/Y-90; 0°	2	0.70	0.70	0.70	0.70	1%
Sr-90/Y-90; 60°	2	0.31	0.31	0.31	0.30	3%
Beta all	6	0.31	0.38	0.70	0.12	70%
N-20; 0°	2	1.01	1.01	1.02	0.99	2%
W-80; 0°	8	0.92	0.93	0.99	0.92	3%
W-80; 60°	2	0.90	0.90	0.91	0.88	2%
N-150; 0°	2	0.72	0.72	0.74	0.71	2%
S-Cs; 0°	2	0.65	0.65	0.68	0.62	6%
Photon all	16	0.92	0.88	1.02	0.62	14%
All	22	0.90	0.74	1.02	0.12	38%

outliers: 1 of 16

fraction of outliers: 6%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv



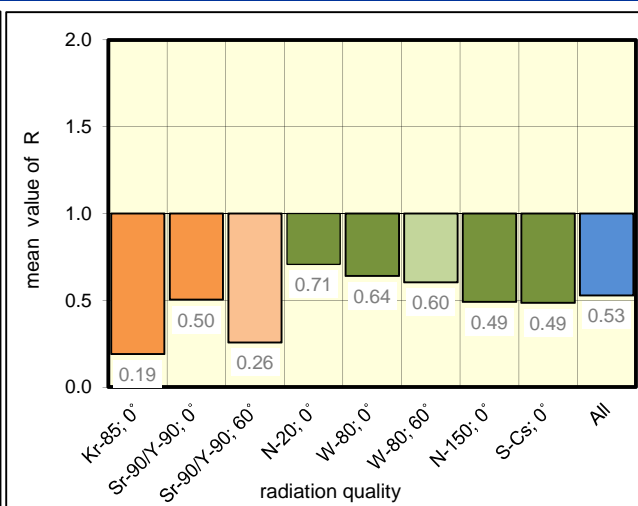
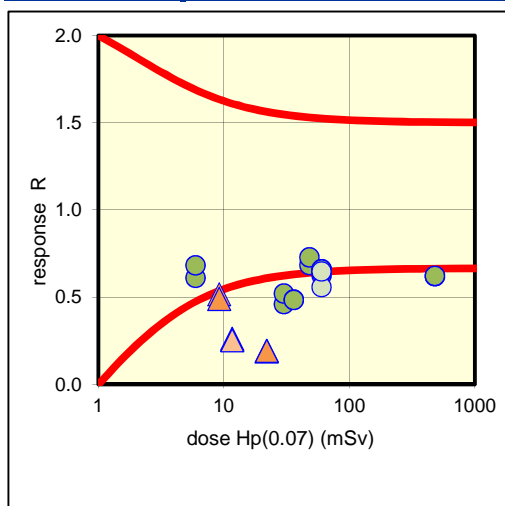
## system 7 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.00	4.154	0.19	(outlier)
		22	22.00	4.253	0.19	(outlier)
	Sr-90/Y-90; 0°	17	9.20	4.753	0.52	(outlier)
		18	9.20	4.508	0.49	(outlier)
		19	11.70	3.060	0.26	(outlier)
Sr-90/Y-90; 60°	20	11.70	2.963	0.25	(outlier)	
	N-20; 0°	11	48.00	32.877	<b>0.68</b>	OK
12		48.00	34.982	<b>0.73</b>	OK	
Photon	W-80; 0°	01	5.96	3.647	<b>0.61</b>	OK
		02	5.96	4.067	<b>0.68</b>	OK
		03	60.20	37.732	<b>0.63</b>	outlier
		04	60.20	38.679	<b>0.64</b>	outlier
		05	60.20	39.740	<b>0.66</b>	OK
		06	60.20	39.644	<b>0.66</b>	OK
		09	480.00	297.727	<b>0.62</b>	outlier
	10	480.00	298.795	<b>0.62</b>	outlier	
	W-80; 60°	07	60.10	33.556	<b>0.56</b>	outlier
		08	60.10	38.968	<b>0.65</b>	OK
	N-150; 0°	13	30.10	13.850	<b>0.46</b>	outlier
14		30.10	15.690	<b>0.52</b>	outlier	
S-Cs; 0°	15	36.00	17.524	<b>0.49</b>	outlier	
	16	36.00	17.418	<b>0.48</b>	outlier	
NIR	NIR	23		0.211		
		24		0.216		
		25		0.224		
		26		0.196		
		27		0.212		
		28		0.251		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.19	0.19	0.19	0.19	2%
Sr-90/Y-90; 0°	2	0.50	0.50	0.52	0.49	4%
Sr-90/Y-90; 60°	2	0.26	0.26	0.26	0.25	2%
Beta all	6	0.26	0.32	0.52	0.19	46%
N-20; 0°	2	0.71	0.71	0.73	0.68	4%
W-80; 0°	8	0.63	0.64	0.68	0.61	4%
W-80; 60°	2	0.60	0.60	0.65	0.56	11%
N-150; 0°	2	0.49	0.49	0.52	0.46	9%
S-Cs; 0°	2	0.49	0.49	0.49	0.48	0%
Photon all	16	0.62	0.61	0.73	0.46	13%
All	22	0.59	0.53	0.73	0.19	31%

outliers: 9 of 16

fraction of outliers: 56%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

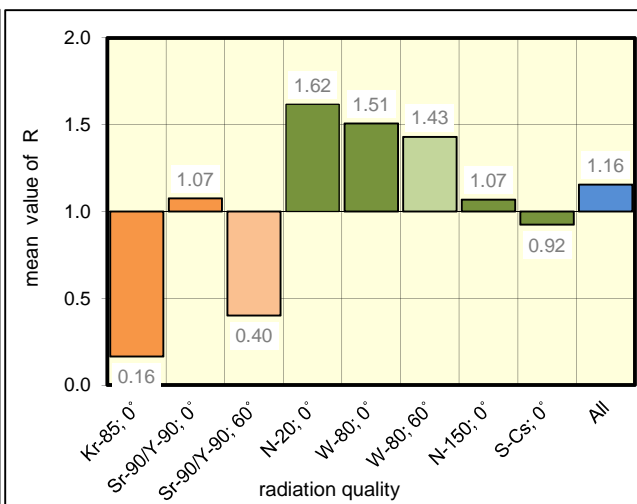
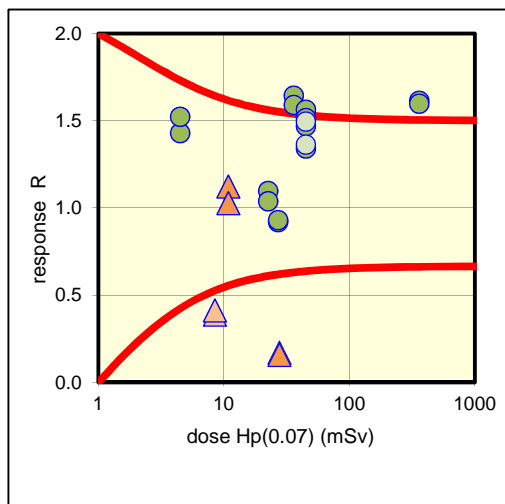
## system 8 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	27.80	4.74	<b>0.17</b>	outlier
		22	27.80	4.38	<b>0.16</b>	outlier
	Sr-90/Y-90; 0°	17	10.90	12.24	<b>1.12</b>	OK
		18	10.90	11.19	<b>1.03</b>	OK
	Sr-90/Y-90; 60°	19	8.50	3.30	<b>0.39</b>	outlier
20		8.50	3.51	<b>0.41</b>	outlier	
Photon	N-20; 0°	11	36.00	59.16	<b>1.64</b>	outlier
		12	36.00	57.28	<b>1.59</b>	outlier
	W-80; 0°	01	4.49	6.42	<b>1.43</b>	OK
		02	4.49	6.84	<b>1.52</b>	OK
		03	45.20	70.66	<b>1.56</b>	outlier
		04	45.20	60.62	<b>1.34</b>	OK
		05	45.20	66.38	<b>1.47</b>	OK
		06	45.20	68.47	<b>1.51</b>	OK
		09	361.00	582.88	<b>1.61</b>	outlier
	10	361.00	576.73	<b>1.60</b>	outlier	
	W-80; 60°	07	45.10	61.48	<b>1.36</b>	OK
		08	45.10	67.45	<b>1.50</b>	OK
	N-150; 0°	13	22.50	24.69	<b>1.10</b>	OK
		14	22.50	23.38	<b>1.04</b>	OK
	S-Cs; 0°	15	27.00	24.80	<b>0.92</b>	OK
16		27.00	25.13	<b>0.93</b>	OK	
NIR	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.09		
	NIR	26		0.04		
	NIR	27		0.00		
	NIR	28		0.07		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.16	0.16	0.17	0.16	6%
Sr-90/Y-90; 0°	2	1.07	1.07	1.12	1.03	6%
Sr-90/Y-90; 60°	2	0.40	0.40	0.41	0.39	4%
<b>Beta all</b>	<b>6</b>	<b>0.40</b>	<b>0.55</b>	<b>1.12</b>	<b>0.16</b>	<b>78%</b>
N-20; 0°	2	1.62	1.62	1.64	1.59	2%
W-80; 0°	8	1.52	1.51	1.61	1.34	6%
W-80; 60°	2	1.43	1.43	1.50	1.36	7%
N-150; 0°	2	1.07	1.07	1.10	1.04	4%
S-Cs; 0°	2	0.92	0.92	0.93	0.92	1%
<b>Photon all</b>	<b>16</b>	<b>1.48</b>	<b>1.38</b>	<b>1.64</b>	<b>0.92</b>	<b>18%</b>
<b>All</b>	<b>22</b>	<b>1.35</b>	<b>1.16</b>	<b>1.64</b>	<b>0.16</b>	<b>42%</b>

outliers: 9 of 22

fraction of outliers: 41%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

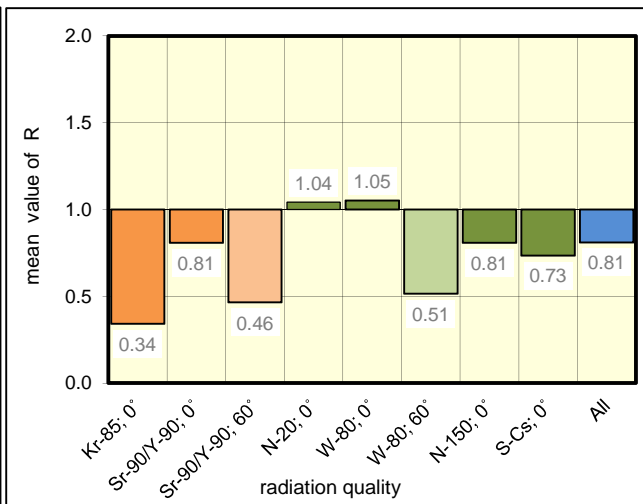
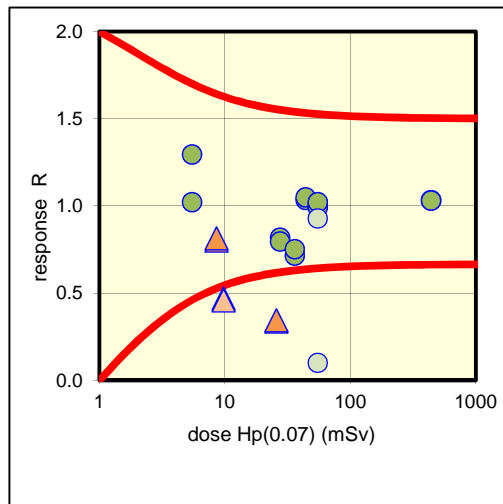
## system 9 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	25.80	8.7	<b>0.34</b>	outlier
		22	25.80	8.9	<b>0.34</b>	outlier
	Sr-90/Y-90; 0°	17	8.60	6.9	<b>0.80</b>	OK
		18	8.60	7.0	<b>0.81</b>	OK
	Sr-90/Y-90; 60°	19	9.80	4.6	<b>0.47</b>	outlier
20		9.80	4.5	<b>0.46</b>	outlier	
Photon	N-20; 0°	11	44.00	45.5	<b>1.03</b>	OK
		12	44.00	46.2	<b>1.05</b>	OK
	W-80; 0°	01	5.48	5.6	<b>1.02</b>	OK
		02	5.48	7.1	<b>1.30</b>	OK
		03	55.20	55.8	<b>1.01</b>	OK
		04	55.20	55.2	<b>1.00</b>	OK
		05	55.20	54.8	<b>0.99</b>	OK
		06	55.20	56.4	<b>1.02</b>	OK
		09	440.00	454.7	<b>1.03</b>	OK
	10	440.00	454.1	<b>1.03</b>	OK	
	W-80; 60°	07	55.10	5.6	<b>0.10</b>	outlier
		08	55.10	51.1	<b>0.93</b>	OK
	N-150; 0°	13	27.50	22.5	<b>0.82</b>	OK
		14	27.50	21.9	<b>0.80</b>	OK
S-Cs; 0°	15	36.00	25.8	<b>0.72</b>	OK	
	16	36.00	27.1	<b>0.75</b>	OK	
NIR	NIR	23		0.0		
	NIR	24		0.0		
	NIR	25		0.0		
	NIR	26		0.0		
	NIR	27		0.0		
	NIR	28		0.0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.34	0.34	0.34	0.34	2%
Sr-90/Y-90; 0°	2	0.81	0.81	0.81	0.80	1%
Sr-90/Y-90; 60°	2	0.46	0.46	0.47	0.46	2%
<b>Beta all</b>	<b>6</b>	<b>0.46</b>	<b>0.54</b>	<b>0.81</b>	<b>0.34</b>	<b>40%</b>
N-20; 0°	2	1.04	1.04	1.05	1.03	1%
W-80; 0°	8	1.02	1.05	1.30	0.99	10%
W-80; 60°	2	0.51	0.51	0.93	0.10	113%
N-150; 0°	2	0.81	0.81	0.82	0.80	2%
S-Cs; 0°	2	0.73	0.73	0.75	0.72	3%
<b>Photon all</b>	<b>16</b>	<b>1.01</b>	<b>0.91</b>	<b>1.30</b>	<b>0.10</b>	<b>28%</b>
<b>All</b>	<b>22</b>	<b>0.87</b>	<b>0.81</b>	<b>1.30</b>	<b>0.10</b>	<b>37%</b>

outliers: 5 of 22

fraction of outliers: 23%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

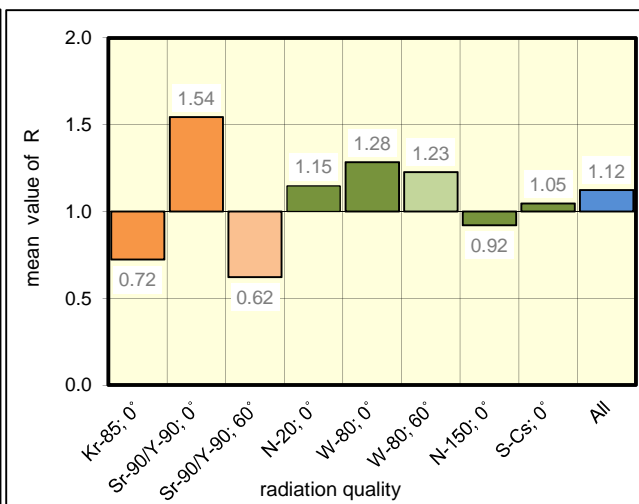
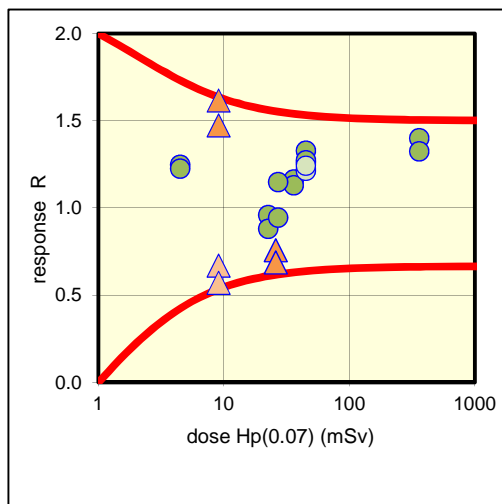
## system 10 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.00	19.7	<b>0.76</b>	OK
		22	26.00	17.9	<b>0.69</b>	OK
	Sr-90/Y-90; 0°	17	9.10	13.4	<b>1.47</b>	OK
		18	9.10	14.7	<b>1.62</b>	OK
		19	9.10	6.1	<b>0.67</b>	OK
Sr-90/Y-90; 60°	20	9.10	5.2	<b>0.57</b>	OK	
Photon	N-20; 0°	11	36.00	41.9	<b>1.16</b>	OK
		12	36.00	40.7	<b>1.13</b>	OK
	W-80; 0°	01	4.49	5.6	<b>1.25</b>	OK
		02	4.49	5.5	<b>1.22</b>	OK
		03	45.10	59.9	<b>1.33</b>	OK
		04	45.10	56.8	<b>1.26</b>	OK
		05	45.10	54.9	<b>1.22</b>	OK
		06	45.10	57.4	<b>1.27</b>	OK
		09	361.00	505.2	<b>1.40</b>	OK
	10	361.00	478.0	<b>1.32</b>	OK	
	W-80; 60°	07	45.10	54.7	<b>1.21</b>	OK
		08	45.10	56.0	<b>1.24</b>	OK
	N-150; 0°	13	22.50	21.6	<b>0.96</b>	OK
		14	22.50	19.8	<b>0.88</b>	OK
	S-Cs; 0°	15	27.00	31.0	<b>1.15</b>	OK
16		27.00	25.5	<b>0.94</b>	OK	
NIR		23		0.30		
		24		0.36		
		25		0.37		
		26		0.34		
		27		0.35		
		28		0.36		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.72	0.72	0.76	0.69	7%
Sr-90/Y-90; 0°	2	1.54	1.54	1.62	1.47	7%
Sr-90/Y-90; 60°	2	0.62	0.62	0.67	0.57	11%
Beta all	<b>6</b>	<b>0.72</b>	<b>0.96</b>	<b>1.62</b>	<b>0.57</b>	<b>47%</b>
N-20; 0°	2	1.15	1.15	1.16	1.13	2%
W-80; 0°	8	1.27	1.28	1.40	1.22	5%
W-80; 60°	2	1.23	1.23	1.24	1.21	2%
N-150; 0°	2	0.92	0.92	0.96	0.88	6%
S-Cs; 0°	2	1.05	1.05	1.15	0.94	14%
Photon all	<b>16</b>	<b>1.22</b>	<b>1.18</b>	<b>1.40</b>	<b>0.88</b>	<b>12%</b>
All	<b>22</b>	<b>1.22</b>	<b>1.12</b>	<b>1.62</b>	<b>0.57</b>	<b>24%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

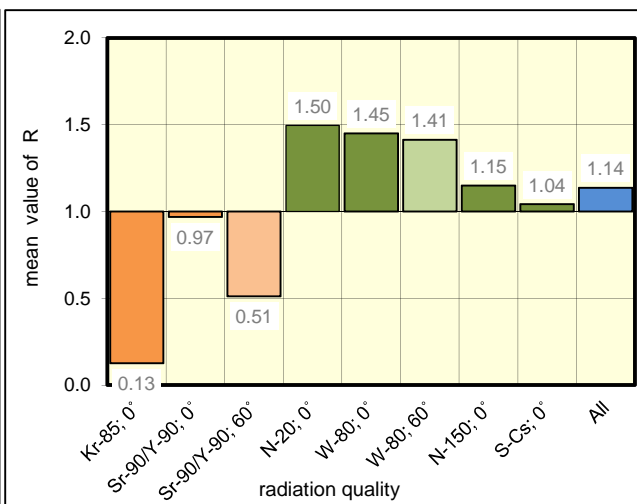
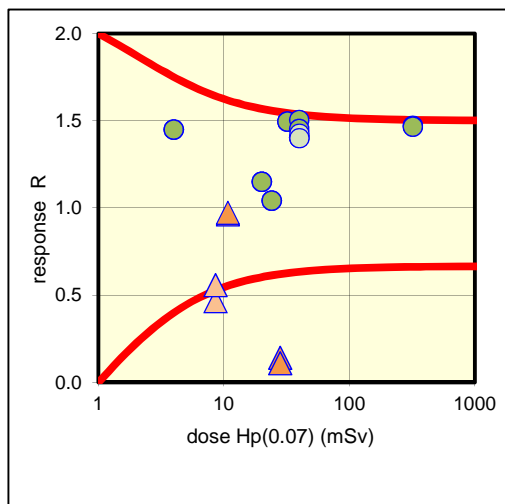
## system 11 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	28.20	4.0	<b>0.14</b>	outlier
		22	28.20	3.1	<b>0.11</b>	outlier
	Sr-90/Y-90; 0°	17	10.80	10.4	<b>0.96</b>	OK
		18	10.80	10.5	<b>0.97</b>	OK
		Sr-90/Y-90; 60°	19	8.60	4.0	<b>0.47</b>
20	8.60		4.8	<b>0.56</b>	OK	
Photon	N-20; 0°	11	32.10	48	<b>1.50</b>	OK
		12	32.10	48	<b>1.50</b>	OK
	W-80; 0°	01	4.00	5.8	<b>1.45</b>	OK
		02	4.00	5.8	<b>1.45</b>	OK
		03	39.90	60	<b>1.50</b>	OK
		04	39.90	56	<b>1.40</b>	OK
		05	39.90	58	<b>1.45</b>	OK
		06	39.90	56	<b>1.40</b>	OK
		09	320.00	471	<b>1.47</b>	OK
		10	320.00	469	<b>1.47</b>	OK
	W-80; 60°	07	40.00	57	<b>1.43</b>	OK
		08	40.00	56	<b>1.40</b>	OK
	N-150; 0°	13	20.00	23	<b>1.15</b>	OK
		14	20.00	23	<b>1.15</b>	OK
	S-Cs; 0°	15	24.00	25	<b>1.04</b>	OK
16		24.00	25	<b>1.04</b>	OK	
NIR	NIR	23		0		
	NIR	24		0		
	NIR	25		0		
	NIR	26		0		
	NIR	27		0		
	NIR	28		0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.13	0.13	0.14	0.11	18%
Sr-90/Y-90; 0°	2	0.97	0.97	0.97	0.96	1%
Sr-90/Y-90; 60°	2	0.51	0.51	0.56	0.47	13%
<b>Beta all</b>	<b>6</b>	<b>0.51</b>	<b>0.54</b>	<b>0.97</b>	<b>0.11</b>	<b>71%</b>
N-20; 0°	2	1.50	1.50	1.50	1.50	0%
W-80; 0°	8	1.45	1.45	1.50	1.40	2%
W-80; 60°	2	1.41	1.41	1.43	1.40	1%
N-150; 0°	2	1.15	1.15	1.15	1.15	0%
S-Cs; 0°	2	1.04	1.04	1.04	1.04	0%
<b>Photon all</b>	<b>16</b>	<b>1.44</b>	<b>1.36</b>	<b>1.50</b>	<b>1.04</b>	<b>12%</b>
<b>All</b>	<b>22</b>	<b>1.40</b>	<b>1.14</b>	<b>1.50</b>	<b>0.11</b>	<b>39%</b>

outliers: 3 of 22

fraction of outliers: 14%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

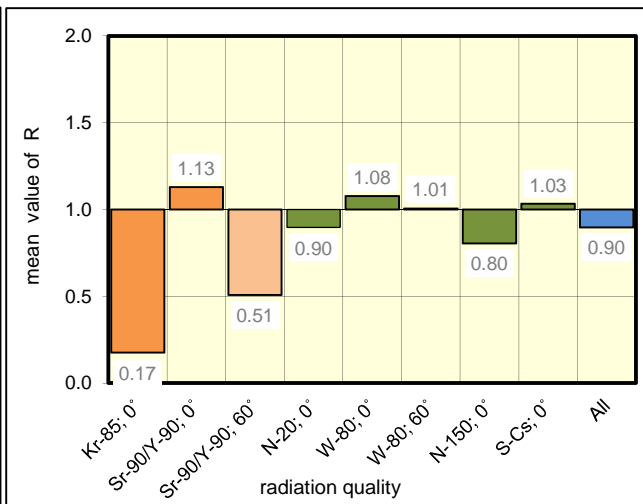
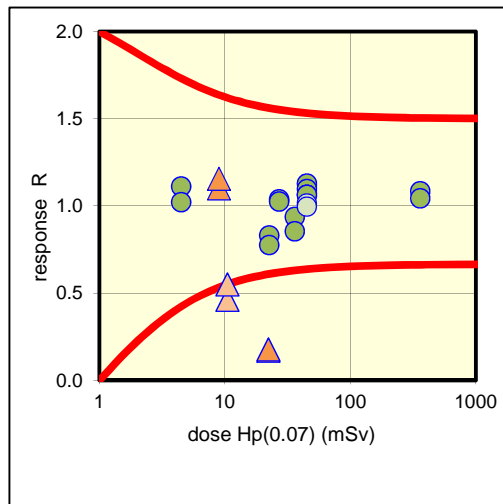
## system 12 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.30	3.82	0.17	(outlier)
		22	22.30	3.98	0.18	(outlier)
	Sr-90/Y-90; 0°	17	9.00	9.91	1.10	(OK)
		18	9.00	10.40	1.16	(OK)
		19	10.50	4.86	0.46	(outlier)
Sr-90/Y-90; 60°	20	10.50	5.78	0.55	(outlier)	
	Photon	N-20; 0°	11	36.00	33.73	<b>0.94</b>
12			36.00	30.77	<b>0.85</b>	OK
W-80; 0°		01	4.48	4.98	<b>1.11</b>	OK
		02	4.48	4.58	<b>1.02</b>	OK
		03	45.10	50.86	<b>1.13</b>	OK
		04	45.10	49.52	<b>1.10</b>	OK
		05	45.10	48.01	<b>1.06</b>	OK
		06	45.10	47.97	<b>1.06</b>	OK
		09	361.00	391.6	<b>1.08</b>	OK
10		361.00	377.0	<b>1.04</b>	OK	
W-80; 60°		07	45.10	45.77	<b>1.01</b>	OK
		08	45.10	44.95	<b>1.00</b>	OK
N-150; 0°		13	22.50	18.72	<b>0.83</b>	OK
		14	22.50	17.46	<b>0.78</b>	OK
S-Cs; 0°		15	27.00	28.05	<b>1.04</b>	OK
		16	27.00	27.69	<b>1.03</b>	OK
	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
	NIR	28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.17	0.17	0.18	0.17	3%
Sr-90/Y-90; 0°	2	1.13	1.13	1.16	1.10	3%
Sr-90/Y-90; 60°	2	0.51	0.51	0.55	0.46	12%
Beta all	6	0.51	0.60	1.16	0.17	72%
N-20; 0°	2	0.90	0.90	0.94	0.85	6%
W-80; 0°	8	1.07	1.08	1.13	1.02	3%
W-80; 60°	2	1.01	1.01	1.01	1.00	1%
N-150; 0°	2	0.80	0.80	0.83	0.78	5%
S-Cs; 0°	2	1.03	1.03	1.04	1.03	1%
Photon all	16	1.03	1.01	1.13	0.78	10%
All	22	1.02	0.90	1.16	0.17	33%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

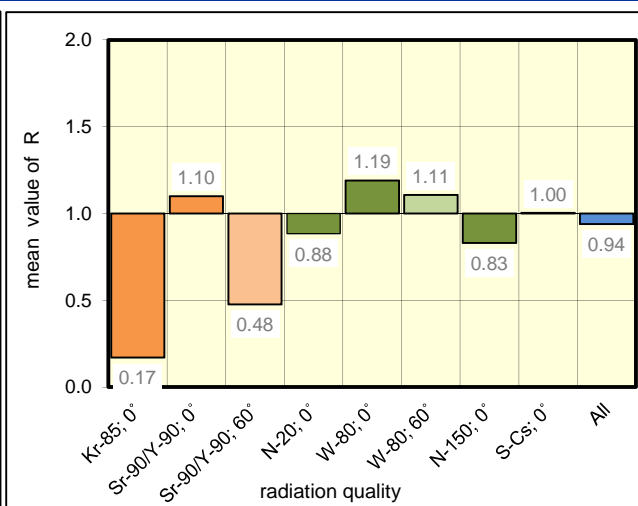
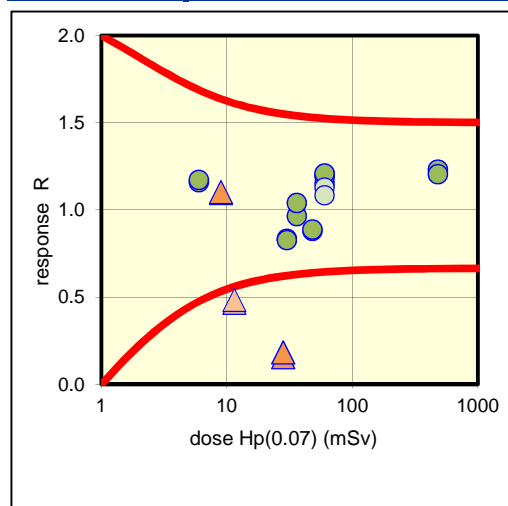
## system 13 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	28.20	4.39	<b>0.16</b>	outlier
		22	28.20	5.17	<b>0.18</b>	outlier
	Sr-90/Y-90; 0°	17	9.00	9.88	<b>1.10</b>	OK
		18	9.00	9.92	<b>1.10</b>	OK
		19	11.50	5.38	<b>0.47</b>	outlier
Sr-90/Y-90; 60°	20	11.50	5.56	<b>0.48</b>	outlier	
Photon	N-20; 0°	11	48.00	42.26	<b>0.88</b>	OK
		12	48.00	42.62	<b>0.89</b>	OK
	W-80; 0°	01	5.97	6.92	<b>1.16</b>	OK
		02	5.97	7.00	<b>1.17</b>	OK
		03	60.20	69.20	<b>1.15</b>	OK
		04	60.20	72.56	<b>1.21</b>	OK
		05	60.20	71.67	<b>1.19</b>	OK
		06	60.20	72.78	<b>1.21</b>	OK
		09	480.00	590.62	<b>1.23</b>	OK
	W-80; 60°	10	480.00	578.44	<b>1.21</b>	OK
	W-80; 60°	07	60.10	67.78	<b>1.13</b>	OK
		08	60.10	65.14	<b>1.08</b>	OK
	N-150; 0°	13	30.10	25.12	<b>0.83</b>	OK
		14	30.10	24.89	<b>0.83</b>	OK
S-Cs; 0°	15	36.00	34.75	<b>0.97</b>	OK	
	16	36.00	37.45	<b>1.04</b>	OK	
NIR	NIR	23				
	NIR	24				
	NIR	25				
	NIR	26				
	NIR	27				
	NIR	28				

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.17	0.17	0.18	0.16	12%
Sr-90/Y-90; 0°	2	1.10	1.10	1.10	1.10	0%
Sr-90/Y-90; 60°	2	0.48	0.48	0.48	0.47	2%
Beta all	<b>6</b>	<b>0.48</b>	<b>0.58</b>	<b>1.10</b>	<b>0.16</b>	<b>73%</b>
N-20; 0°	2	0.88	0.88	0.89	0.88	1%
W-80; 0°	8	1.20	1.19	1.23	1.15	2%
W-80; 60°	2	1.11	1.11	1.13	1.08	3%
N-150; 0°	2	0.83	0.83	0.83	0.83	1%
S-Cs; 0°	2	1.00	1.00	1.04	0.97	5%
Photon all	<b>16</b>	<b>1.14</b>	<b>1.07</b>	<b>1.23</b>	<b>0.83</b>	<b>14%</b>
All	<b>22</b>	<b>1.09</b>	<b>0.94</b>	<b>1.23</b>	<b>0.16</b>	<b>35%</b>

outliers: 4 of 22

fraction of outliers: 18%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

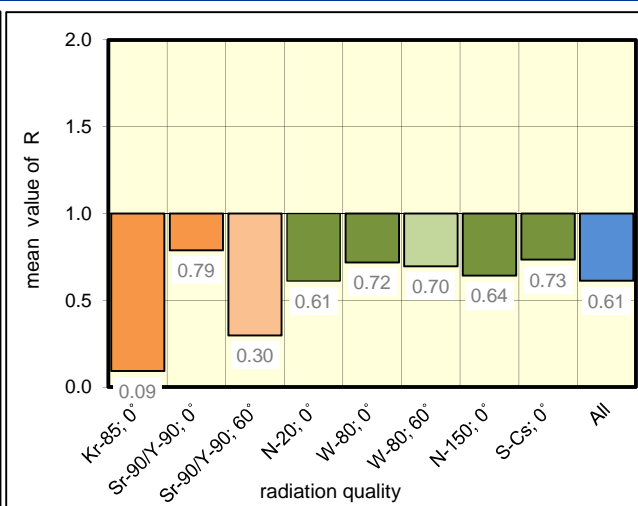
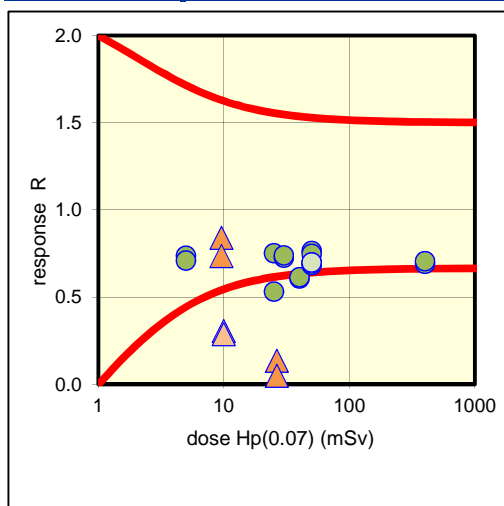
## system 14 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.50	3.61	0.14	(outlier)
		22	26.50	1.31	0.05	(outlier)
	Sr-90/Y-90; 0°	17	9.60	8.06	0.84	(OK)
		18	9.60	7.07	0.74	(OK)
		19	10.00	3.06	0.31	(outlier)
Sr-90/Y-90; 60°	20	10.00	2.88	0.29	(outlier)	
	N-20; 0°	11	40.00	24.3	<b>0.61</b>	outlier
Photon		W-80; 0°	12	40.00	24.6	<b>0.62</b>
	01		4.98	3.67	<b>0.74</b>	OK
	02		4.98	3.54	<b>0.71</b>	OK
	03		50.10	38.3	<b>0.76</b>	OK
	04		50.10	37.5	<b>0.75</b>	OK
	05		50.10	35.0	<b>0.70</b>	OK
	06		50.10	34.3	<b>0.68</b>	OK
	09		400.00	277	<b>0.69</b>	OK
	10		400.00	283	<b>0.71</b>	OK
	W-80; 60°		07	50.10	34.7	<b>0.69</b>
08		50.10	35.0	<b>0.70</b>	OK	
N-150; 0°	13	25.00	13.3	<b>0.53</b>	outlier	
	14	25.00	18.8	<b>0.75</b>	OK	
S-Cs; 0°	15	30.00	21.8	<b>0.73</b>	OK	
	16	30.00	22.2	<b>0.74</b>	OK	
NIR	NIR	23		0.25		
		24		0.24		
		25		0.25		
		26		0.25		
		27		0.25		
		28		0.25		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.09	0.09	0.14	0.05	66%
Sr-90/Y-90; 0°	2	0.79	0.79	0.84	0.74	9%
Sr-90/Y-90; 60°	2	0.30	0.30	0.31	0.29	4%
Beta all	6	0.30	0.39	0.84	0.05	82%
N-20; 0°	2	0.61	0.61	0.62	0.61	1%
W-80; 0°	8	0.71	0.72	0.76	0.68	4%
W-80; 60°	2	0.70	0.70	0.70	0.69	1%
N-150; 0°	2	0.64	0.64	0.75	0.53	24%
S-Cs; 0°	2	0.73	0.73	0.74	0.73	1%
Photon all	16	0.70	0.69	0.76	0.53	9%
All	22	0.70	0.61	0.84	0.05	35%

outliers: 3 of 16

fraction of outliers: 19%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv



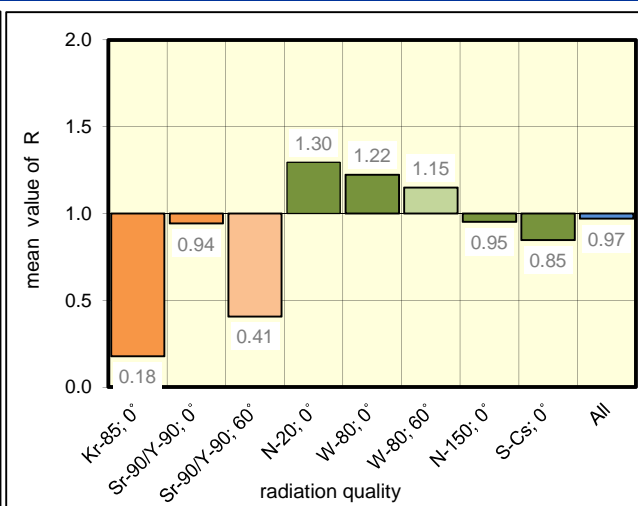
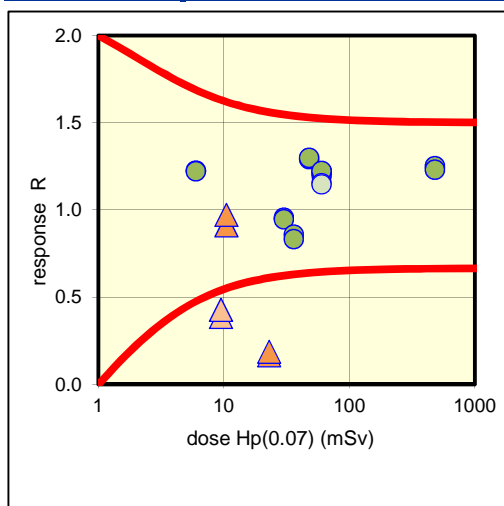
## system 15 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.00	3.83	0.17	(outlier)
		22	23.00	4.30	0.19	(outlier)
	Sr-90/Y-90; 0°	17	10.50	9.58	0.91	(OK)
		18	10.50	10.2	0.97	(OK)
		19	9.50	3.67	0.39	(outlier)
Sr-90/Y-90; 60°	20	9.50	4.06	0.43	(outlier)	
	Photon	N-20; 0°	11	47.90	61.9	<b>1.29</b>
12			47.90	62.2	<b>1.30</b>	OK
W-80; 0°		01	5.97	7.32	<b>1.23</b>	OK
		02	5.97	7.29	<b>1.22</b>	OK
		03	60.30	73.5	<b>1.22</b>	OK
		04	60.30	72.2	<b>1.20</b>	OK
		05	60.30	73.5	<b>1.22</b>	OK
		06	60.30	73.8	<b>1.22</b>	OK
		09	480.00	601	<b>1.25</b>	OK
		10	480.00	591	<b>1.23</b>	OK
W-80; 60°	07	60.10	69.3	<b>1.15</b>	OK	
	08	60.10	68.9	<b>1.15</b>	OK	
N-150; 0°	13	30.10	28.8	<b>0.96</b>	OK	
	14	30.10	28.5	<b>0.95</b>	OK	
S-Cs; 0°	15	36.00	30.9	<b>0.86</b>	OK	
	16	36.00	30.0	<b>0.83</b>	OK	
NIR	NIR	23		0		
		24		0		
		25		0		
		26		0		
		27		0		
		28		0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.18	0.18	0.19	0.17	8%
Sr-90/Y-90; 0°	2	0.94	0.94	0.97	0.91	4%
Sr-90/Y-90; 60°	2	0.41	0.41	0.43	0.39	7%
Beta all	6	0.41	0.51	0.97	0.17	69%
N-20; 0°	2	1.30	1.30	1.30	1.29	0%
W-80; 0°	8	1.22	1.22	1.25	1.20	1%
W-80; 60°	2	1.15	1.15	1.15	1.15	0%
N-150; 0°	2	0.95	0.95	0.96	0.95	1%
S-Cs; 0°	2	0.85	0.85	0.86	0.83	2%
Photon all	16	1.22	1.14	1.30	0.83	13%
All	22	1.15	0.97	1.30	0.17	37%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

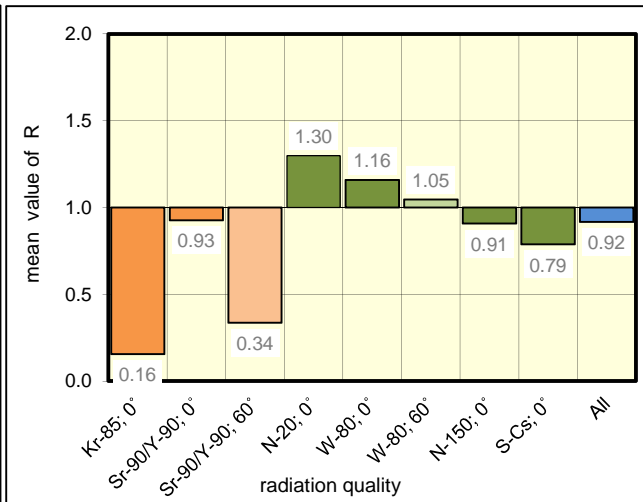
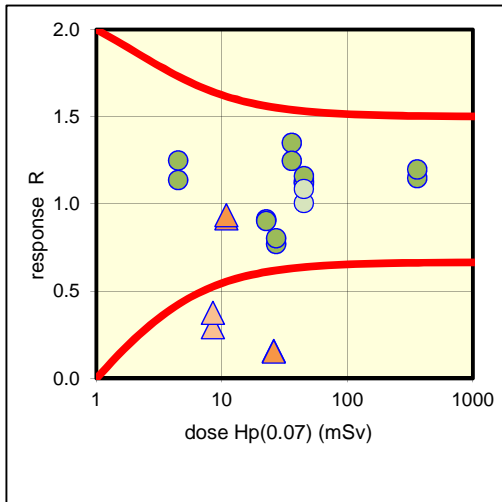
## system 16 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.00	4.1	<b>0.16</b>	outlier
		22	26.00	4.0	<b>0.15</b>	outlier
	Sr-90/Y-90; 0°	17	10.90	10.0	<b>0.92</b>	OK
		18	10.90	10.2	<b>0.94</b>	OK
	Sr-90/Y-90; 60°	19	8.50	2.5	<b>0.29</b>	outlier
20		8.50	3.2	<b>0.38</b>	outlier	
Photon	N-20; 0°	11	36.00	48.6	<b>1.35</b>	OK
		12	36.00	44.9	<b>1.25</b>	OK
	W-80; 0°	01	4.48	5.1	<b>1.14</b>	OK
		02	4.48	5.6	<b>1.25</b>	OK
		03	45.10	51.1	<b>1.13</b>	OK
		04	45.10	50.6	<b>1.12</b>	OK
		05	45.10	50.5	<b>1.12</b>	OK
		06	45.10	52.3	<b>1.16</b>	OK
		09	361.00	414.5	<b>1.15</b>	OK
	10	361.00	432.8	<b>1.20</b>	OK	
	W-80; 60°	07	45.10	45.3	<b>1.00</b>	OK
		08	45.10	49.0	<b>1.09</b>	OK
	N-150; 0°	13	22.50	20.5	<b>0.91</b>	OK
		14	22.50	20.3	<b>0.90</b>	OK
	S-Cs; 0°	15	27.00	20.8	<b>0.77</b>	OK
16		27.00	21.7	<b>0.80</b>	OK	
NIR	NIR	23		0.0		
	NIR	24		0.0		
	NIR	25		0.0		
	NIR	26		0.0		
	NIR	27		0.0		
	NIR	28		0.0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.16	0.16	0.16	0.15	2%
Sr-90/Y-90; 0°	2	0.93	0.93	0.94	0.92	1%
Sr-90/Y-90; 60°	2	0.34	0.34	0.38	0.29	17%
<b>Beta all</b>	<b>6</b>	<b>0.34</b>	<b>0.47</b>	<b>0.94</b>	<b>0.15</b>	<b>77%</b>
N-20; 0°	2	1.30	1.30	1.35	1.25	6%
W-80; 0°	8	1.14	1.16	1.25	1.12	4%
W-80; 60°	2	1.05	1.05	1.09	1.00	6%
N-150; 0°	2	0.91	0.91	0.91	0.90	1%
S-Cs; 0°	2	0.79	0.79	0.80	0.77	3%
<b>Photon all</b>	<b>16</b>	<b>1.13</b>	<b>1.08</b>	<b>1.35</b>	<b>0.77</b>	<b>15%</b>
<b>All</b>	<b>22</b>	<b>1.05</b>	<b>0.92</b>	<b>1.35</b>	<b>0.15</b>	<b>39%</b>

**outliers: 4 of 22**

**fraction of outliers: 18%**



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

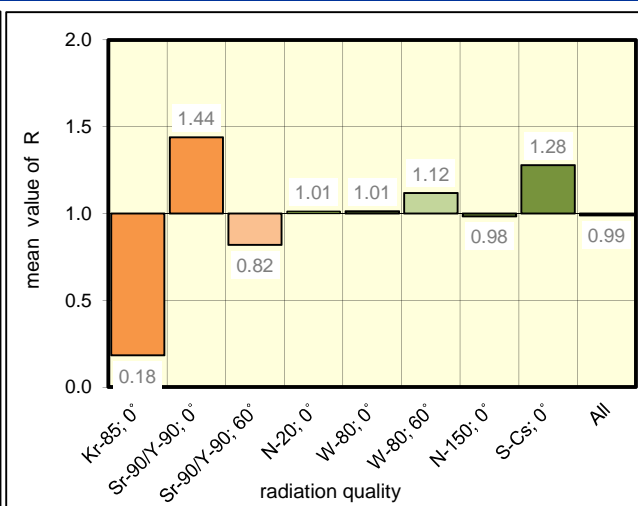
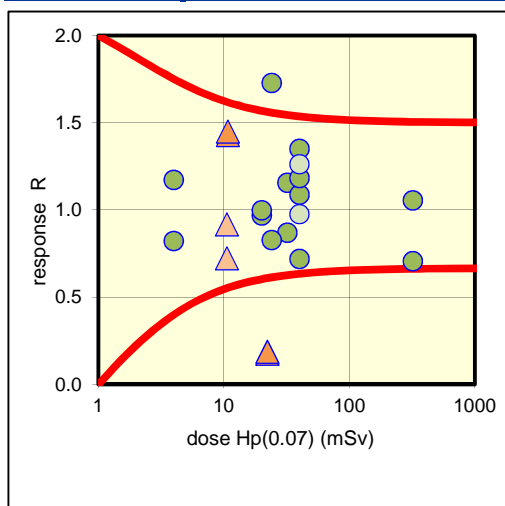
## system 17 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result		
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)		
Beta	Kr-85; 0°	21	22.30	3.93	<b>0.18</b>	outlier	
		22	22.30	4.19	<b>0.19</b>	outlier	
	Sr-90/Y-90; 0°	17	10.80	15.43	<b>1.43</b>	OK	
		18	10.80	15.65	<b>1.45</b>	OK	
		19	10.60	9.72	<b>0.92</b>	OK	
Sr-90/Y-90; 60°	20	10.60	7.66	<b>0.72</b>	OK		
	N-20; 0°	11	32.10	37.10	<b>1.16</b>	OK	
12		32.10	27.90	<b>0.87</b>	OK		
Photon	W-80; 0°	01	4.00	3.29	<b>0.82</b>	OK	
		02	4.00	4.69	<b>1.17</b>	OK	
		03	40.10	54.17	<b>1.35</b>	OK	
		04	40.10	43.61	<b>1.09</b>	OK	
		05	40.10	28.88	<b>0.72</b>	OK	
		06	40.10	47.43	<b>1.18</b>	OK	
		09	320.00	337.35	<b>1.05</b>	OK	
		10	320.00	226.18	<b>0.71</b>	OK	
		W-80; 60°	07	40.00	39.02	<b>0.98</b>	OK
			08	40.00	50.47	<b>1.26</b>	OK
	N-150; 0°	13	20.00	19.38	<b>0.97</b>	OK	
14		20.00	19.96	<b>1.00</b>	OK		
S-Cs; 0°	15	24.00	41.49	<b>1.73</b>	outlier		
	16	24.00	19.88	<b>0.83</b>	OK		
	NIR	23					
	NIR	24					
	NIR	25					
	NIR	26					
	NIR	27					
	NIR	28					

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.18	0.18	0.19	0.18	5%
Sr-90/Y-90; 0°	2	1.44	1.44	1.45	1.43	1%
Sr-90/Y-90; 60°	2	0.82	0.82	0.92	0.72	17%
Beta all	<b>6</b>	<b>0.82</b>	<b>0.81</b>	<b>1.45</b>	<b>0.18</b>	<b>70%</b>
N-20; 0°	2	1.01	1.01	1.16	0.87	20%
W-80; 0°	8	1.07	1.01	1.35	0.71	23%
W-80; 60°	2	1.12	1.12	1.26	0.98	18%
N-150; 0°	2	0.98	0.98	1.00	0.97	2%
S-Cs; 0°	2	1.28	1.28	1.73	0.83	50%
Photon all	<b>16</b>	<b>1.03</b>	<b>1.06</b>	<b>1.73</b>	<b>0.71</b>	<b>25%</b>
All	<b>22</b>	<b>0.99</b>	<b>0.99</b>	<b>1.73</b>	<b>0.18</b>	<b>37%</b>

outliers: 3 of 22

fraction of outliers: 14%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

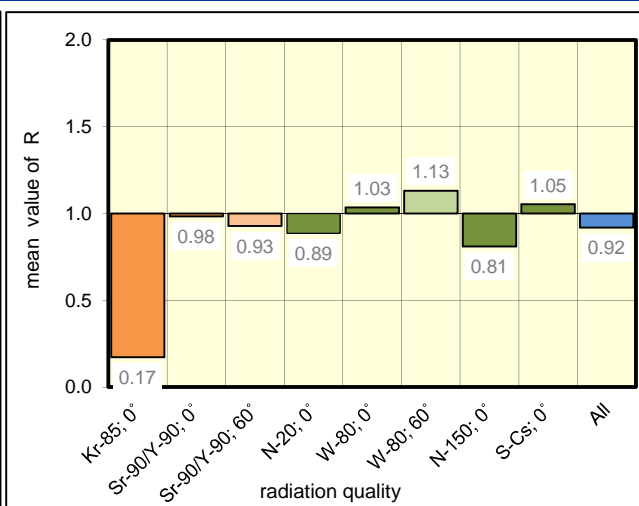
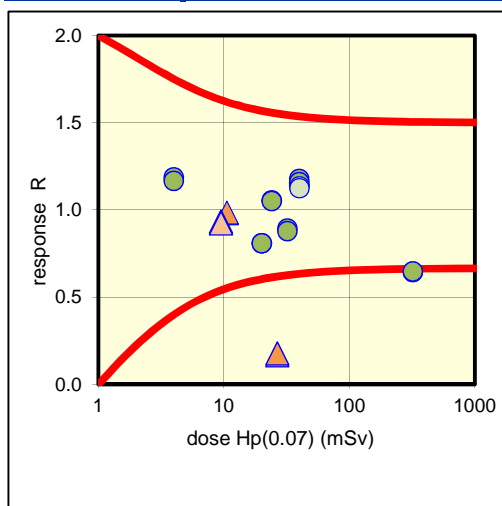
## system 18 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.70	4.47	<b>0.17</b>	outlier
		22	26.70	4.75	<b>0.18</b>	outlier
	Sr-90/Y-90; 0°	17	10.60	10.402	<b>0.98</b>	OK
		18	10.60	10.434	<b>0.98</b>	OK
		19	9.50	8.864	<b>0.93</b>	OK
Sr-90/Y-90; 60°	20	9.50	8.774	<b>0.92</b>	OK	
	Photon	N-20; 0°	11	32.10	28.684	<b>0.89</b>
12			32.10	28.220	<b>0.88</b>	OK
W-80; 0°		01	4.00	4.746	<b>1.19</b>	OK
		02	4.00	4.669	<b>1.17</b>	OK
		03	39.90	45.557	<b>1.14</b>	OK
		04	39.90	46.962	<b>1.18</b>	OK
		05	39.90	45.966	<b>1.15</b>	OK
		06	39.90	46.288	<b>1.16</b>	OK
		09	320.00	206.361	<b>0.64</b>	outlier
W-80; 60°		10	320.00	207.388	<b>0.65</b>	outlier
		07	40.00	45.430	<b>1.14</b>	OK
N-150; 0°		08	40.00	44.992	<b>1.12</b>	OK
		13	20.00	16.202	<b>0.81</b>	OK
S-Cs; 0°		14	20.00	16.193	<b>0.81</b>	OK
		15	24.00	25.324	<b>1.06</b>	OK
NIR		16	24.00	25.240	<b>1.05</b>	OK
	23			ZERO		
	24			ZERO		
NIR	25			ZERO		
	26			ZERO		
	27			ZERO		
	28			ZERO		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.17	0.17	0.18	0.17	4%
Sr-90/Y-90; 0°	2	0.98	0.98	0.98	0.98	0%
Sr-90/Y-90; 60°	2	0.93	0.93	0.93	0.92	1%
<b>Beta all</b>	<b>6</b>	<b>0.93</b>	<b>0.69</b>	<b>0.98</b>	<b>0.17</b>	<b>58%</b>
N-20; 0°	2	0.89	0.89	0.89	0.88	1%
W-80; 0°	8	1.16	1.03	1.19	0.64	23%
W-80; 60°	2	1.13	1.13	1.14	1.12	1%
N-150; 0°	2	0.81	0.81	0.81	0.81	0%
S-Cs; 0°	2	1.05	1.05	1.06	1.05	0%
<b>Photon all</b>	<b>16</b>	<b>1.09</b>	<b>1.00</b>	<b>1.19</b>	<b>0.64</b>	<b>19%</b>
<b>All</b>	<b>22</b>	<b>0.98</b>	<b>0.92</b>	<b>1.19</b>	<b>0.17</b>	<b>32%</b>

outliers: 4 of 22

fraction of outliers: 18%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

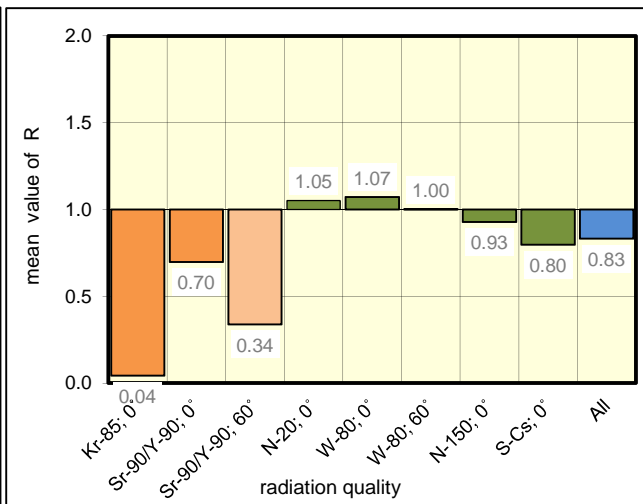
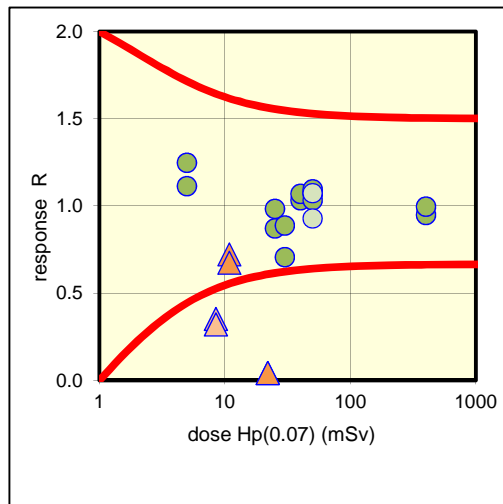
## system 19 : beta dosemeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.00	0.93	<b>0.04</b>	outlier
		22	22.00	0.95	<b>0.04</b>	outlier
	Sr-90/Y-90; 0°	17	10.90	7.87	<b>0.72</b>	OK
		18	10.90	7.35	<b>0.67</b>	OK
	Sr-90/Y-90; 60°	19	8.50	3.00	<b>0.35</b>	outlier
		20	8.50	2.73	<b>0.32</b>	outlier
Photon	N-20; 0°	11	40.00	41.31	1.03	(OK)
		12	40.00	42.78	1.07	(OK)
	W-80; 0°	01	4.98	6.21	1.25	(OK)
		02	4.98	5.55	1.11	(OK)
		03	50.10	53.60	1.07	(OK)
		04	50.10	53.94	1.08	(OK)
		05	50.10	51.72	1.03	(OK)
		06	50.10	54.88	1.10	(OK)
		09	400.00	379.41	0.95	(OK)
	10	400.00	398.40	1.00	(OK)	
	W-80; 60°	07	50.10	53.80	1.07	(OK)
		08	50.10	46.53	0.93	(OK)
	N-150; 0°	13	25.00	21.77	0.87	(OK)
		14	25.00	24.60	0.98	(OK)
S-Cs; 0°	15	30.00	21.19	0.71	(OK)	
	16	30.00	26.65	0.89	(OK)	
	NIR	23		-0.01		
	NIR	24		-0.01		
	NIR	25		-0.01		
	NIR	26		0.01		
	NIR	27		0.04		
	NIR	28		-0.02		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.04	0.04	0.04	0.04	2%
Sr-90/Y-90; 0°	2	0.70	0.70	0.72	0.67	5%
Sr-90/Y-90; 60°	2	0.34	0.34	0.35	0.32	7%
Beta all	<b>6</b>	<b>0.34</b>	<b>0.36</b>	<b>0.72</b>	<b>0.04</b>	<b>82%</b>
N-20; 0°	2	1.05	1.05	1.07	1.03	2%
W-80; 0°	8	1.07	1.07	1.25	0.95	8%
W-80; 60°	2	1.00	1.00	1.07	0.93	10%
N-150; 0°	2	0.93	0.93	0.98	0.87	9%
S-Cs; 0°	2	0.80	0.80	0.89	0.71	16%
Photon all	16	1.03	1.01	1.25	0.71	12%
All	<b>22</b>	<b>0.97</b>	<b>0.83</b>	<b>1.25</b>	<b>0.04</b>	<b>41%</b>

outliers: 4 of 6

fraction of outliers: 67%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

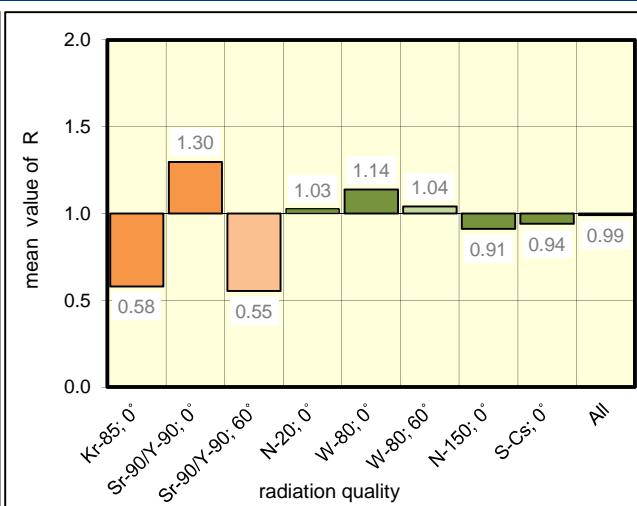
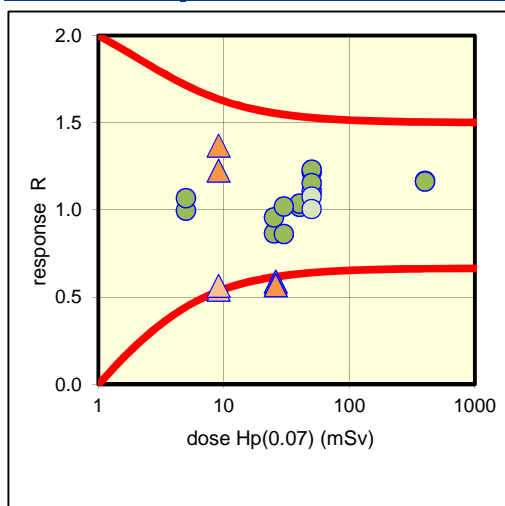
## system 20 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.00	15.32	<b>0.59</b>	outlier
		22	26.00	14.80	<b>0.57</b>	outlier
	Sr-90/Y-90; 0°	17	9.10	11.15	<b>1.23</b>	OK
		18	9.10	12.46	<b>1.37</b>	OK
		Sr-90/Y-90; 60°	19	9.10	4.94	<b>0.54</b>
20	9.10		5.14	<b>0.56</b>	OK	
Photon	N-20; 0°	11	40.00	40.70	<b>1.02</b>	OK
		12	40.00	41.43	<b>1.04</b>	OK
	W-80; 0°	01	4.98	4.96	<b>1.00</b>	OK
		02	4.98	5.32	<b>1.07</b>	OK
		03	50.10	61.03	<b>1.22</b>	OK
		04	50.10	61.63	<b>1.23</b>	OK
		05	50.10	55.52	<b>1.11</b>	OK
		06	50.10	57.82	<b>1.15</b>	OK
		09	400.00	466.75	<b>1.17</b>	OK
	10	400.00	465.38	<b>1.16</b>	OK	
	W-80; 60°	07	50.20	54.08	<b>1.08</b>	OK
		08	50.20	50.46	<b>1.01</b>	OK
	N-150; 0°	13	25.00	21.67	<b>0.87</b>	OK
		14	25.00	23.93	<b>0.96</b>	OK
S-Cs; 0°	15	30.00	25.86	<b>0.86</b>	OK	
	16	30.00	30.60	<b>1.02</b>	OK	
NIR	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
	NIR	28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.58	0.58	0.59	0.57	2%
Sr-90/Y-90; 0°	2	1.30	1.30	1.37	1.23	8%
Sr-90/Y-90; 60°	2	0.55	0.55	0.56	0.54	3%
<b>Beta all</b>	<b>6</b>	<b>0.58</b>	<b>0.81</b>	<b>1.37</b>	<b>0.54</b>	<b>47%</b>
N-20; 0°	2	1.03	1.03	1.04	1.02	1%
W-80; 0°	8	1.16	1.14	1.23	1.00	7%
W-80; 60°	2	1.04	1.04	1.08	1.01	5%
N-150; 0°	2	0.91	0.91	0.96	0.87	7%
S-Cs; 0°	2	0.94	0.94	1.02	0.86	12%
<b>Photon all</b>	<b>16</b>	<b>1.05</b>	<b>1.06</b>	<b>1.23</b>	<b>0.86</b>	<b>11%</b>
<b>All</b>	<b>22</b>	<b>1.03</b>	<b>0.99</b>	<b>1.37</b>	<b>0.54</b>	<b>24%</b>

outliers: 2 of 22

fraction of outliers: 9%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

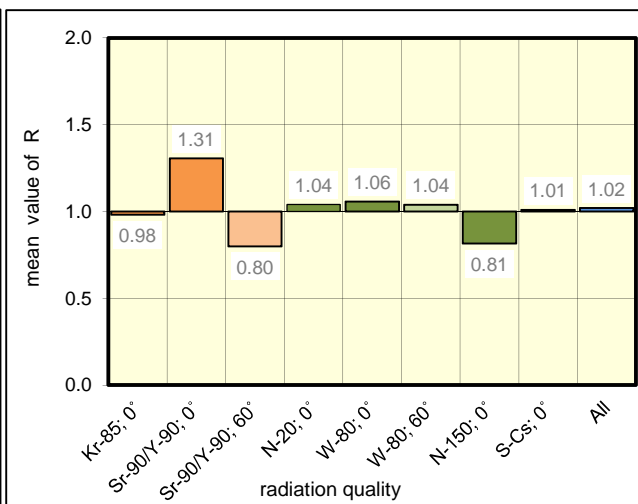
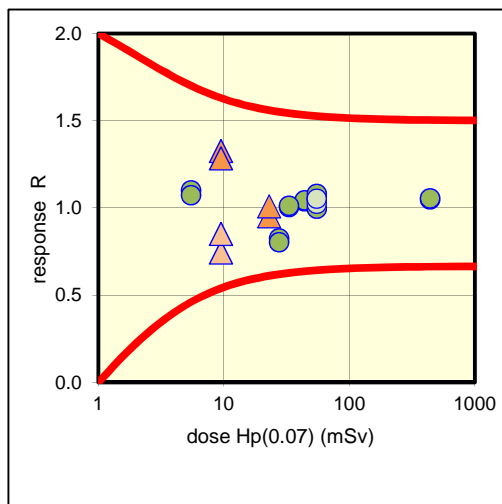
## system 21 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.00	21.9	<b>0.95</b>	OK
		22	23.00	23.2	<b>1.01</b>	OK
	Sr-90/Y-90; 0°	17	9.50	12.6	<b>1.33</b>	OK
		18	9.50	12.2	<b>1.28</b>	OK
		19	9.50	7.08	<b>0.75</b>	OK
Sr-90/Y-90; 60°	20	9.50	8.08	<b>0.85</b>	OK	
Photon	N-20; 0°	11	44.00	45.7	<b>1.04</b>	OK
		12	44.00	45.9	<b>1.04</b>	OK
	W-80; 0°	01	5.48	6.03	<b>1.10</b>	OK
		02	5.48	5.88	<b>1.07</b>	OK
		03	55.20	58.2	<b>1.05</b>	OK
		04	55.20	55.0	<b>1.00</b>	OK
		05	55.20	59.7	<b>1.08</b>	OK
		06	55.20	57.9	<b>1.05</b>	OK
		09	440.00	462	<b>1.05</b>	OK
	W-80; 60°	10	440.00	464	<b>1.05</b>	OK
		07	55.10	56.4	<b>1.02</b>	OK
	W-80; 60°	08	55.10	58.0	<b>1.05</b>	OK
	N-150; 0°	13	27.50	22.7	<b>0.83</b>	OK
14		27.50	22.1	<b>0.80</b>	OK	
S-Cs; 0°	15	33.00	33.2	<b>1.01</b>	OK	
	16	33.00	33.4	<b>1.01</b>	OK	
NIR	NIR	23		0		
	NIR	24		0		
	NIR	25		0		
	NIR	26		0		
	NIR	27		0		
	NIR	28		0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.98	0.98	1.01	0.95	4%
Sr-90/Y-90; 0°	2	1.31	1.31	1.33	1.28	2%
Sr-90/Y-90; 60°	2	0.80	0.80	0.85	0.75	9%
Beta all	<b>6</b>	<b>0.98</b>	<b>1.03</b>	<b>1.33</b>	<b>0.75</b>	<b>23%</b>
N-20; 0°	2	1.04	1.04	1.04	1.04	0%
W-80; 0°	8	1.05	1.06	1.10	1.00	3%
W-80; 60°	2	1.04	1.04	1.05	1.02	2%
N-150; 0°	2	0.81	0.81	0.83	0.80	2%
S-Cs; 0°	2	1.01	1.01	1.01	1.01	0%
Photon all	<b>16</b>	<b>1.05</b>	<b>1.02</b>	<b>1.10</b>	<b>0.80</b>	<b>8%</b>
All	<b>22</b>	<b>1.04</b>	<b>1.02</b>	<b>1.33</b>	<b>0.75</b>	<b>13%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

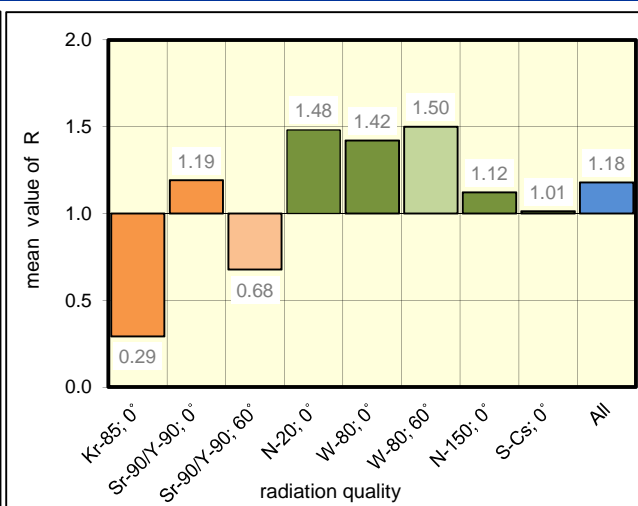
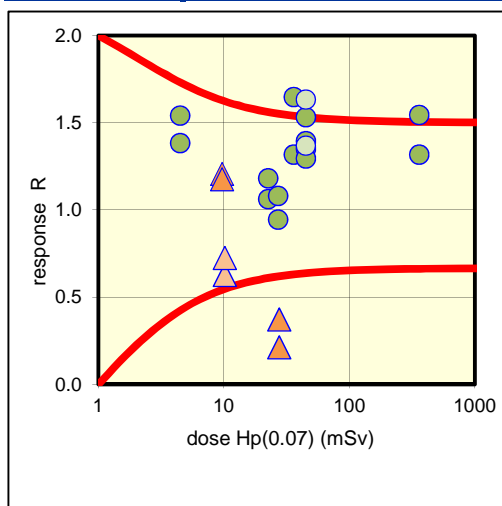
## system 22 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	27.70	10.3	0.37	(outlier)
		22	27.70	5.9	0.21	(outlier)
	Sr-90/Y-90; 0°	17	9.70	11.7	1.21	(OK)
		18	9.70	11.4	1.18	(OK)
		19	10.20	6.4	0.63	(OK)
Sr-90/Y-90; 60°	20	10.20	7.4	0.73	(OK)	
	Photon	N-20; 0°	11	36.00	47.4	<b>1.32</b>
12			36.00	59.3	<b>1.65</b>	outlier
W-80; 0°		01	4.48	6.2	<b>1.38</b>	OK
		02	4.48	6.9	<b>1.54</b>	OK
		03	45.10	60.9	<b>1.35</b>	OK
		04	45.10	62.9	<b>1.39</b>	OK
		05	45.10	69.1	<b>1.53</b>	outlier
		06	45.10	58.4	<b>1.29</b>	OK
		09	361.00	475.4	<b>1.32</b>	OK
		10	361.00	557.4	<b>1.54</b>	outlier
W-80; 60°		07	45.10	61.7	<b>1.37</b>	OK
		08	45.10	73.6	<b>1.63</b>	outlier
N-150; 0°		13	22.50	26.6	<b>1.18</b>	OK
		14	22.50	23.9	<b>1.06</b>	OK
S-Cs; 0°		15	27.00	25.5	<b>0.94</b>	OK
		16	27.00	29.2	<b>1.08</b>	OK
	NIR	23		0.0		
	NIR	24		0.0		
	NIR	25		0.0		
	NIR	26		0.0		
	NIR	27		0.0		
	NIR	28		0.0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.29	0.29	0.37	0.21	38%
Sr-90/Y-90; 0°	2	1.19	1.19	1.21	1.18	2%
Sr-90/Y-90; 60°	2	0.68	0.68	0.73	0.63	10%
Beta all	6	0.68	0.72	1.21	0.21	57%
N-20; 0°	2	1.48	1.48	1.65	1.32	16%
W-80; 0°	8	1.39	1.42	1.54	1.29	7%
W-80; 60°	2	1.50	1.50	1.63	1.37	12%
N-150; 0°	2	1.12	1.12	1.18	1.06	8%
S-Cs; 0°	2	1.01	1.01	1.08	0.94	10%
Photon all	16	<b>1.36</b>	<b>1.35</b>	<b>1.65</b>	<b>0.94</b>	<b>15%</b>
All	22	1.31	1.18	1.65	0.21	33%

outliers: 4 of 16

fraction of outliers: 25%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv



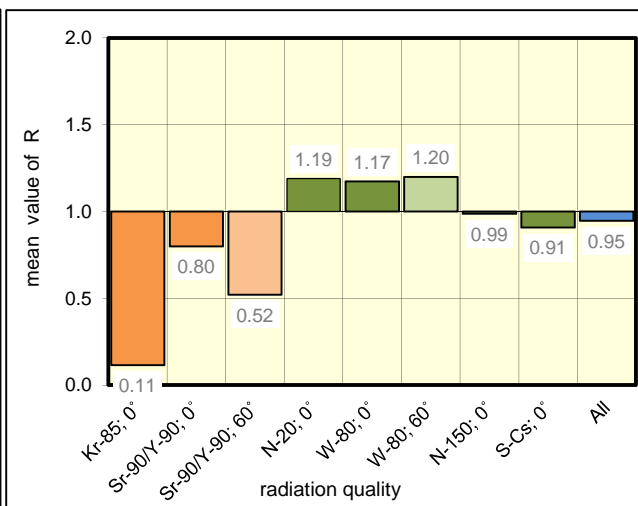
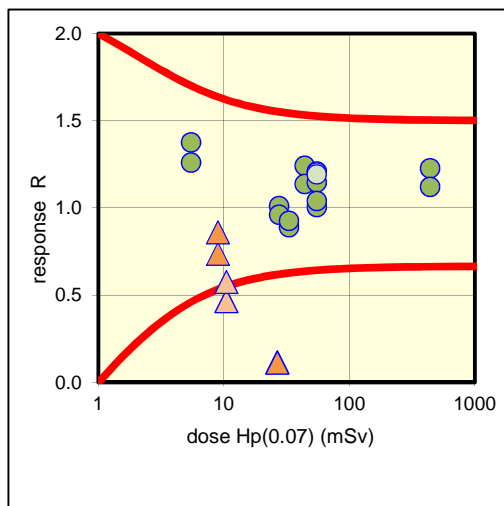
## system 23 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.70	3.07	<b>0.11</b>	outlier
		22	26.70	3.02	<b>0.11</b>	outlier
	Sr-90/Y-90; 0°	17	9.00	6.63	<b>0.74</b>	OK
		18	9.00	7.75	<b>0.86</b>	OK
		19	10.50	4.90	<b>0.47</b>	outlier
Sr-90/Y-90; 60°	20	10.50	6.04	<b>0.58</b>	OK	
	Photon	N-20; 0°	11	44.00	54.61	<b>1.24</b>
12			44.00	50.07	<b>1.14</b>	OK
W-80; 0°		01	5.48	7.54	<b>1.38</b>	OK
		02	5.48	6.91	<b>1.26</b>	OK
		03	55.20	63.33	<b>1.15</b>	OK
		04	55.20	66.74	<b>1.21</b>	OK
		05	55.20	55.53	<b>1.01</b>	OK
		06	55.20	57.38	<b>1.04</b>	OK
		09	440.00	540.17	<b>1.23</b>	OK
		10	440.00	493.14	<b>1.12</b>	OK
W-80; 60°	07	55.10	66.34	<b>1.20</b>	OK	
	08	55.10	65.75	<b>1.19</b>	OK	
N-150; 0°	13	27.50	27.82	<b>1.01</b>	OK	
	14	27.50	26.46	<b>0.96</b>	OK	
S-Cs; 0°	15	33.00	29.35	<b>0.89</b>	OK	
	16	33.00	30.57	<b>0.93</b>	OK	
	NIR	23		0.14		
	NIR	24		0.11		
	NIR	25		0.15		
	NIR	26		0.12		
	NIR	27		0.11		
	NIR	28		0.13		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.11	0.11	0.11	0.11	1%
Sr-90/Y-90; 0°	2	0.80	0.80	0.86	0.74	11%
Sr-90/Y-90; 60°	2	0.52	0.52	0.58	0.47	15%
Beta all	<b>6</b>	<b>0.52</b>	<b>0.48</b>	<b>0.86</b>	<b>0.11</b>	<b>65%</b>
N-20; 0°	2	1.19	1.19	1.24	1.14	6%
W-80; 0°	8	1.18	1.17	1.38	1.01	10%
W-80; 60°	2	1.20	1.20	1.20	1.19	1%
N-150; 0°	2	0.99	0.99	1.01	0.96	4%
S-Cs; 0°	2	0.91	0.91	0.93	0.89	3%
Photon all	<b>16</b>	<b>1.14</b>	<b>1.12</b>	<b>1.38</b>	<b>0.89</b>	<b>12%</b>
All	<b>22</b>	<b>1.03</b>	<b>0.95</b>	<b>1.38</b>	<b>0.11</b>	<b>37%</b>

outliers: 3 of 22

fraction of outliers: 14%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

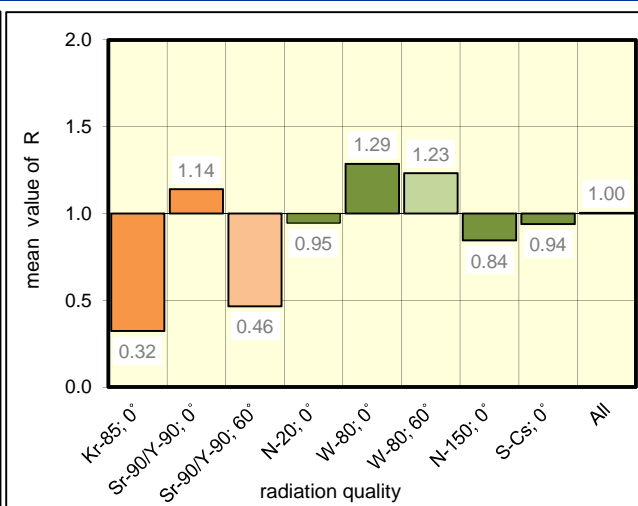
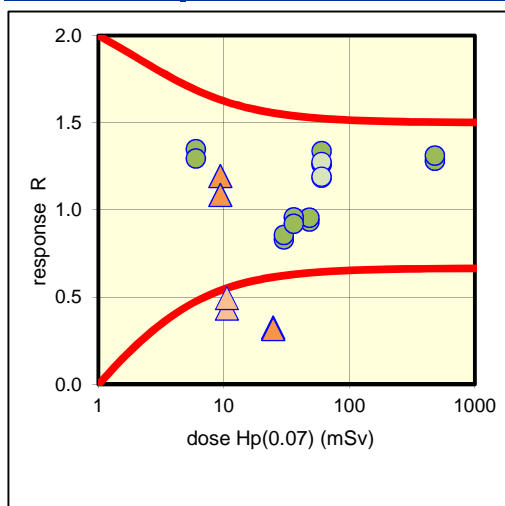
## system 24 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	24.80	8.11	0.33	(outlier)
		22	24.80	7.88	0.32	(outlier)
	Sr-90/Y-90; 0°	17	9.40	11.23	1.19	(OK)
		18	9.40	10.21	1.09	(OK)
		19	10.60	4.62	0.44	(outlier)
Sr-90/Y-90; 60°	20	10.60	5.24	0.49	(outlier)	
	Photon	N-20; 0°	11	48.00	44.86	<b>0.93</b>
12			48.00	45.87	<b>0.96</b>	OK
W-80; 0°		01	5.97	8.05	<b>1.35</b>	OK
		02	5.97	7.74	<b>1.30</b>	OK
		03	60.30	76.07	<b>1.26</b>	OK
		04	60.30	71.50	<b>1.19</b>	OK
		05	60.30	76.24	<b>1.26</b>	OK
		06	60.30	80.62	<b>1.34</b>	OK
		09	480.00	615.45	<b>1.28</b>	OK
		10	480.00	629.37	<b>1.31</b>	OK
W-80; 60°		07	60.10	76.62	<b>1.27</b>	OK
		08	60.10	71.54	<b>1.19</b>	OK
N-150; 0°		13	30.10	25.04	<b>0.83</b>	OK
		14	30.10	25.78	<b>0.86</b>	OK
S-Cs; 0°		15	36.00	34.50	<b>0.96</b>	OK
		16	36.00	33.17	<b>0.92</b>	OK
NIR	NIR	23		0.23		
		24		0.25		
		25		0.25		
		26		0.23		
		27		0.25		
		28		0.23		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.32	0.32	0.33	0.32	2%
Sr-90/Y-90; 0°	2	1.14	1.14	1.19	1.09	7%
Sr-90/Y-90; 60°	2	0.46	0.46	0.49	0.44	9%
Beta all	6	0.46	0.64	1.19	0.32	61%
N-20; 0°	2	0.95	0.95	0.96	0.93	2%
W-80; 0°	8	1.29	1.29	1.35	1.19	4%
W-80; 60°	2	1.23	1.23	1.27	1.19	5%
N-150; 0°	2	0.84	0.84	0.86	0.83	2%
S-Cs; 0°	2	0.94	0.94	0.96	0.92	3%
Photon all	16	1.23	1.14	1.35	0.83	17%
All	22	1.14	1.00	1.35	0.32	34%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

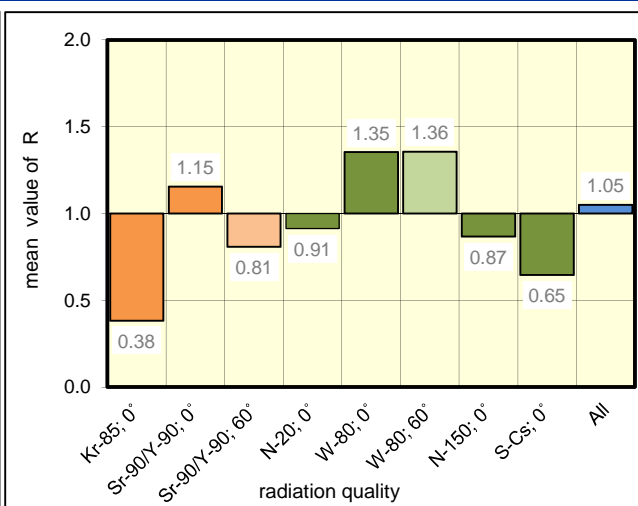
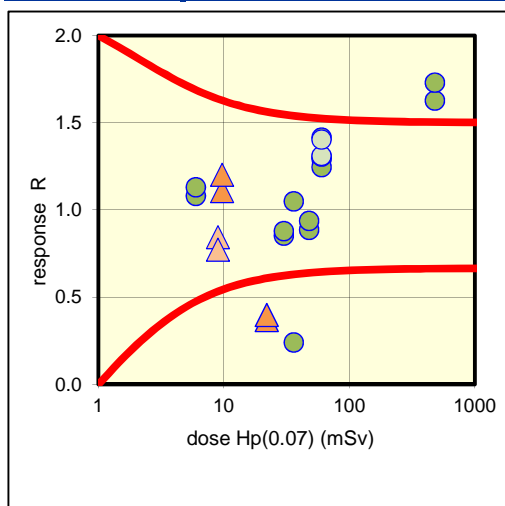
## system 25 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.00	8.10	<b>0.37</b>	outlier
		22	22.00	8.75	<b>0.40</b>	outlier
	Sr-90/Y-90; 0°	17	9.70	10.75	<b>1.11</b>	OK
		18	9.70	11.65	<b>1.20</b>	OK
		19	9.00	7.60	<b>0.84</b>	OK
Sr-90/Y-90; 60°	20	9.00	6.95	<b>0.77</b>	OK	
Photon	N-20; 0°	11	47.90	42.45	<b>0.89</b>	OK
		12	47.90	44.95	<b>0.94</b>	OK
	W-80; 0°	01	5.97	6.45	<b>1.08</b>	OK
		02	5.97	6.75	<b>1.13</b>	OK
		03	60.20	77.85	<b>1.29</b>	OK
		04	60.20	75.00	<b>1.25</b>	OK
		05	60.20	85.20	<b>1.42</b>	OK
		06	60.20	78.60	<b>1.31</b>	OK
		09	480.00	780.75	<b>1.63</b>	outlier
	10	480.00	829.90	<b>1.73</b>	outlier	
	W-80; 60°	07	60.10	78.70	<b>1.31</b>	OK
		28	60.10	84.35	<b>1.40</b>	OK
	N-150; 0°	13	30.10	25.70	<b>0.85</b>	OK
14		30.10	26.45	<b>0.88</b>	OK	
S-Cs; 0°	15	36.00	37.75	<b>1.05</b>	OK	
	16	36.00	8.70	<b>0.24</b>	outlier	
NIR		23		0.05		
		24		0.05		
		25		0.05		
		26		0.05		
		27		0.05		
	WIR	08		71.80		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.38	0.38	0.40	0.37	5%
Sr-90/Y-90; 0°	2	1.15	1.15	1.20	1.11	6%
Sr-90/Y-90; 60°	2	0.81	0.81	0.84	0.77	6%
<b>Beta all</b>	<b>6</b>	<b>0.81</b>	<b>0.78</b>	<b>1.20</b>	<b>0.37</b>	<b>44%</b>
N-20; 0°	2	0.91	0.91	0.94	0.89	4%
W-80; 0°	8	1.30	1.35	1.73	1.08	17%
W-80; 60°	2	1.36	1.36	1.40	1.31	5%
N-150; 0°	2	0.87	0.87	0.88	0.85	2%
S-Cs; 0°	2	0.65	0.65	1.05	0.24	88%
<b>Photon all</b>	<b>16</b>	<b>1.19</b>	<b>1.15</b>	<b>1.73</b>	<b>0.24</b>	<b>31%</b>
<b>All</b>	<b>22</b>	<b>1.09</b>	<b>1.05</b>	<b>1.73</b>	<b>0.24</b>	<b>37%</b>

outliers: 5 of 22

fraction of outliers: 23%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

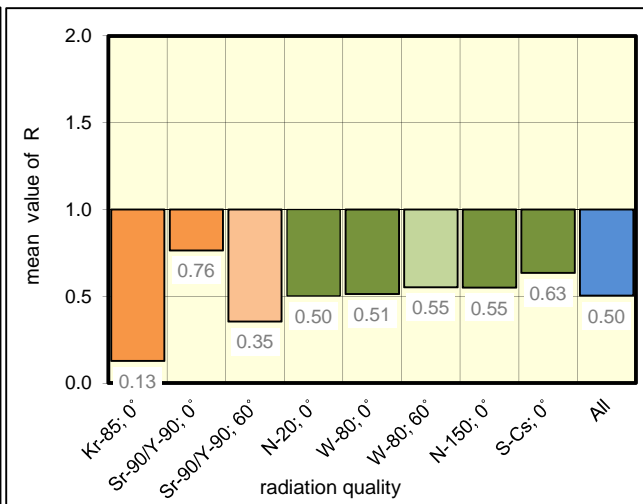
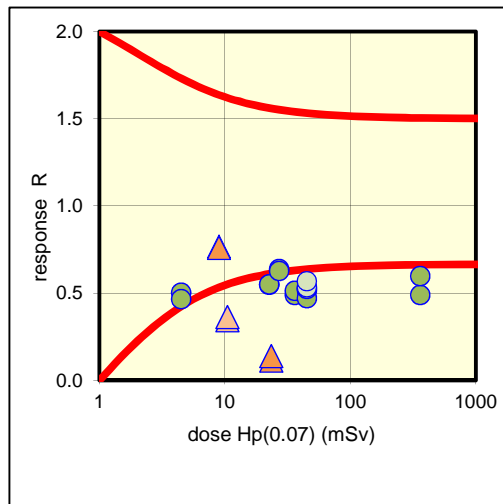
## system 26 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.50	2.67	<b>0.11</b>	outlier
		22	23.50	3.29	<b>0.14</b>	outlier
	Sr-90/Y-90; 0°	17	9.00	6.91	<b>0.77</b>	OK
		18	9.00	6.84	<b>0.76</b>	OK
	Sr-90/Y-90; 60°	19	10.50	3.62	<b>0.34</b>	outlier
20		10.50	3.82	<b>0.36</b>	outlier	
Photon	N-20; 0°	11	36.00	17.62	<b>0.49</b>	outlier
		12	36.00	18.52	<b>0.51</b>	outlier
	W-80; 0°	01	4.48	2.25	<b>0.50</b>	OK
		02	4.48	2.09	<b>0.47</b>	OK
		03	45.10	23.32	<b>0.52</b>	outlier
		04	45.10	23.91	<b>0.53</b>	outlier
		05	45.10	21.31	<b>0.47</b>	outlier
		06	45.10	23.69	<b>0.53</b>	outlier
		09	361.00	176.81	<b>0.49</b>	outlier
	10	361.00	215.78	<b>0.60</b>	outlier	
	W-80; 60°	07	45.20	24.12	<b>0.53</b>	outlier
		08	45.20	25.74	<b>0.57</b>	outlier
	N-150; 0°	13	22.50	12.37	<b>0.55</b>	outlier
		14	22.50	12.40	<b>0.55</b>	outlier
S-Cs; 0°	15	27.00	17.27	<b>0.64</b>	OK	
	16	27.00	16.96	<b>0.63</b>	OK	
NIR	NIR	23		0		
	NIR	24		0		
	NIR	25		0		
	NIR	26		0		
	NIR	27		0		
	NIR	28		0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.13	0.13	0.14	0.11	15%
Sr-90/Y-90; 0°	2	0.76	0.76	0.77	0.76	1%
Sr-90/Y-90; 60°	2	0.35	0.35	0.36	0.34	4%
<b>Beta all</b>	<b>6</b>	<b>0.35</b>	<b>0.41</b>	<b>0.77</b>	<b>0.11</b>	<b>70%</b>
N-20; 0°	2	0.50	0.50	0.51	0.49	4%
W-80; 0°	8	0.51	0.51	0.60	0.47	8%
W-80; 60°	2	0.55	0.55	0.57	0.53	5%
N-150; 0°	2	0.55	0.55	0.55	0.55	0%
S-Cs; 0°	2	0.63	0.63	0.64	0.63	1%
<b>Photon all</b>	<b>16</b>	<b>0.53</b>	<b>0.54</b>	<b>0.64</b>	<b>0.47</b>	<b>10%</b>
<b>All</b>	<b>22</b>	<b>0.52</b>	<b>0.50</b>	<b>0.77</b>	<b>0.11</b>	<b>31%</b>

outliers: 16 of 22

fraction of outliers: 73%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

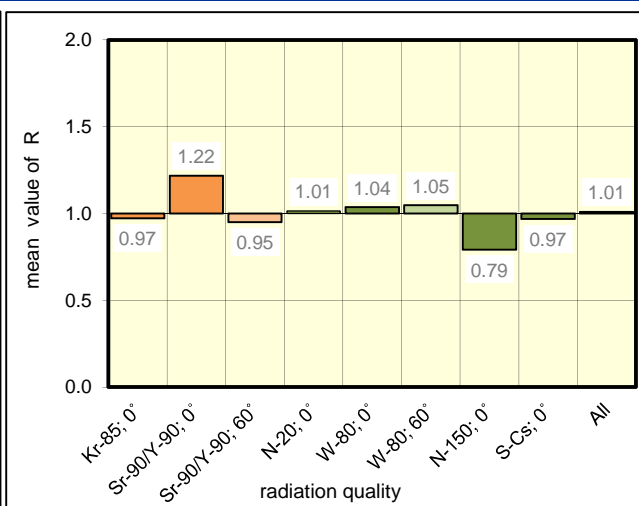
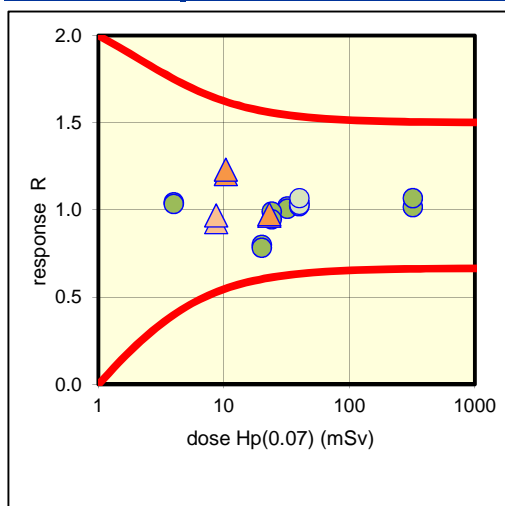
## system 27 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.10	22.337	<b>0.97</b>	OK
		22	23.10	22.553	<b>0.98</b>	OK
	Sr-90/Y-90; 0°	17	10.40	12.530	<b>1.20</b>	OK
		18	10.40	12.799	<b>1.23</b>	OK
		19	8.70	8.085	<b>0.93</b>	OK
Sr-90/Y-90; 60°	20	8.70	8.430	<b>0.97</b>	OK	
Photon	N-20; 0°	11	32.10	32.744	<b>1.02</b>	OK
		12	32.10	32.355	<b>1.01</b>	OK
	W-80; 0°	01	4.00	4.174	<b>1.04</b>	OK
		02	4.00	4.136	<b>1.03</b>	OK
		03	39.90	41.574	<b>1.04</b>	OK
		04	39.90	40.940	<b>1.03</b>	OK
		05	39.90	41.488	<b>1.04</b>	OK
		06	39.90	40.802	<b>1.02</b>	OK
		09	320.00	325.087	<b>1.02</b>	OK
		10	320.00	341.749	<b>1.07</b>	OK
	W-80; 60°	07	40.00	41.133	<b>1.03</b>	OK
		08	40.00	42.723	<b>1.07</b>	OK
	N-150; 0°	13	20.00	15.998	<b>0.80</b>	OK
		14	20.00	15.685	<b>0.78</b>	OK
	S-Cs; 0°	15	24.00	23.782	<b>0.99</b>	OK
16		24.00	22.707	<b>0.95</b>	OK	
	NIR	23		0.000		
	NIR	24		0.000		
	NIR	25		0.000		
	NIR	26		0.000		
	NIR	27		0.000		
	NIR	28		0.000		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.97	0.97	0.98	0.97	1%
Sr-90/Y-90; 0°	2	1.22	1.22	1.23	1.20	2%
Sr-90/Y-90; 60°	2	0.95	0.95	0.97	0.93	3%
<b>Beta all</b>	<b>6</b>	<b>0.97</b>	<b>1.05</b>	<b>1.23</b>	<b>0.93</b>	<b>13%</b>
N-20; 0°	2	1.01	1.01	1.02	1.01	1%
W-80; 0°	8	1.04	1.04	1.07	1.02	2%
W-80; 60°	2	1.05	1.05	1.07	1.03	3%
N-150; 0°	2	0.79	0.79	0.80	0.78	1%
S-Cs; 0°	2	0.97	0.97	0.99	0.95	3%
<b>Photon all</b>	<b>16</b>	<b>1.02</b>	<b>1.00</b>	<b>1.07</b>	<b>0.78</b>	<b>9%</b>
<b>All</b>	<b>22</b>	<b>1.02</b>	<b>1.01</b>	<b>1.23</b>	<b>0.78</b>	<b>10%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

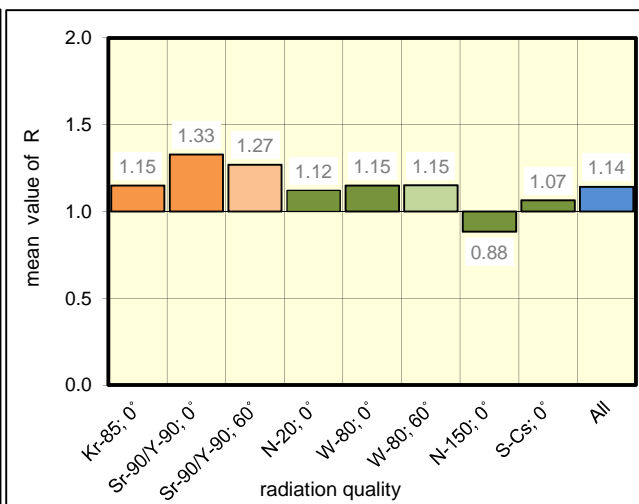
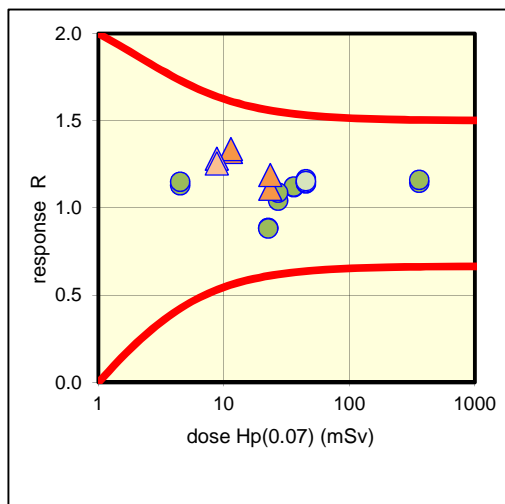
## system 28 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.50	26.09	<b>1.11</b>	OK
		22	23.50	27.92	<b>1.19</b>	OK
	Sr-90/Y-90; 0°	17	11.40	15.05	<b>1.32</b>	OK
		18	11.40	15.24	<b>1.34</b>	OK
		19	8.80	11.29	<b>1.28</b>	OK
Sr-90/Y-90; 60°	20	8.80	11.05	<b>1.26</b>	OK	
Photon	N-20; 0°	11	36.00	40.27	<b>1.12</b>	OK
		12	36.00	40.42	<b>1.12</b>	OK
	W-80; 0°	01	4.48	5.06	<b>1.13</b>	OK
		02	4.48	5.15	<b>1.15</b>	OK
		03	45.10	51.59	<b>1.14</b>	OK
		04	45.10	52.54	<b>1.16</b>	OK
		05	45.10	51.45	<b>1.14</b>	OK
		06	45.10	52.07	<b>1.15</b>	OK
		09	361.00	413.11	<b>1.14</b>	OK
		10	361.00	419.52	<b>1.16</b>	OK
	W-80; 60°	07	45.20	51.80	<b>1.15</b>	OK
		08	45.20	52.19	<b>1.15</b>	OK
	N-150; 0°	13	22.50	19.93	<b>0.89</b>	OK
		14	22.50	19.84	<b>0.88</b>	OK
S-Cs; 0°	15	27.00	28.15	<b>1.04</b>	OK	
	16	27.00	29.37	<b>1.09</b>	OK	
	NIR	23				
	NIR	24				
	NIR	25				
	NIR	26				
	NIR	27				
	NIR	28				

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	1.15	1.15	1.19	1.11	5%
Sr-90/Y-90; 0°	2	1.33	1.33	1.34	1.32	1%
Sr-90/Y-90; 60°	2	1.27	1.27	1.28	1.26	2%
Beta all	<b>6</b>	<b>1.27</b>	<b>1.25</b>	<b>1.34</b>	<b>1.11</b>	<b>7%</b>
N-20; 0°	2	1.12	1.12	1.12	1.12	0%
W-80; 0°	8	1.15	1.15	1.16	1.13	1%
W-80; 60°	2	1.15	1.15	1.15	1.15	1%
N-150; 0°	2	0.88	0.88	0.89	0.88	0%
S-Cs; 0°	2	1.07	1.07	1.09	1.04	3%
Photon all	<b>16</b>	<b>1.14</b>	<b>1.10</b>	<b>1.16</b>	<b>0.88</b>	<b>8%</b>
All	<b>22</b>	<b>1.15</b>	<b>1.14</b>	<b>1.34</b>	<b>0.88</b>	<b>10%</b>

**outliers: 0 of 22**

**fraction of outliers: 0%**



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

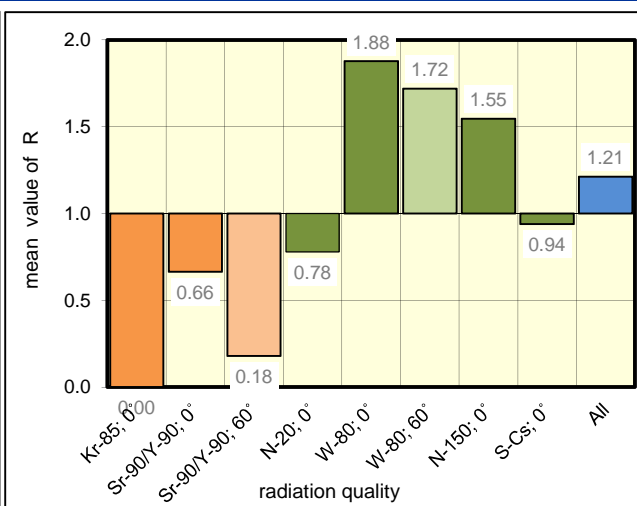
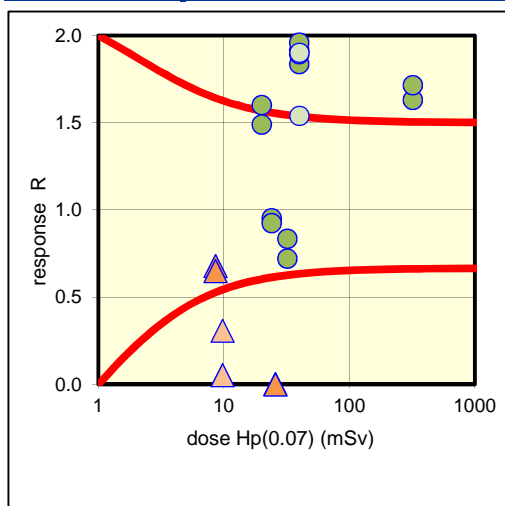
## system 29 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	25.80	0.032	0.00	(outlier)
		22	25.80	0.018	0.00	(outlier)
	Sr-90/Y-90; 0°	17	8.60	5.835	0.68	(OK)
		18	8.60	5.584	0.65	(OK)
		19	9.80	3.013	0.31	(outlier)
Sr-90/Y-90; 60°	20	9.80	0.518	0.05	(outlier)	
	N-20; 0°	11	32.10	26.819	<b>0.84</b>	OK
		12	32.10	23.161	<b>0.72</b>	OK
Photon	W-80; 0°	01	4.00	8.046	<b>2.01</b>	outlier
		02	4.00	8.220	<b>2.06</b>	outlier
		03	39.90	76.430	<b>1.92</b>	outlier
		04	39.90	73.243	<b>1.84</b>	outlier
		05	39.90	78.160	<b>1.96</b>	outlier
		06	39.90	75.546	<b>1.89</b>	outlier
		09	320.00	521.744	<b>1.63</b>	outlier
		10	320.00	548.751	<b>1.71</b>	outlier
	W-80; 60°	07	40.00	61.558	<b>1.54</b>	outlier
		08	40.00	76.021	<b>1.90</b>	outlier
	N-150; 0°	13	20.00	32.042	<b>1.60</b>	outlier
		14	20.00	29.785	<b>1.49</b>	OK
	S-Cs; 0°	15	24.00	22.843	<b>0.95</b>	OK
16		24.00	22.214	<b>0.93</b>	OK	
NIR		23		0.257		
		24		0.257		
		25		0.261		
		26		0.256		
		27		0.263		
		28		0.257		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.00	0.00	0.00	0.00	40%
Sr-90/Y-90; 0°	2	0.66	0.66	0.68	0.65	3%
Sr-90/Y-90; 60°	2	0.18	0.18	0.31	0.05	100%
Beta all	6	0.18	0.28	0.68	0.00	113%
N-20; 0°	2	0.78	0.78	0.84	0.72	10%
W-80; 0°	8	1.90	1.88	2.06	1.63	8%
W-80; 60°	2	1.72	1.72	1.90	1.54	15%
N-150; 0°	2	1.55	1.55	1.60	1.49	5%
S-Cs; 0°	2	0.94	0.94	0.95	0.93	2%
Photon all	16	1.67	1.56	2.06	0.72	29%
All	22	1.51	1.21	2.06	0.00	59%

outliers: 11 of 16

fraction of outliers: 69%



Results: IC2009 2 values out of diagramme range (>2)!

trumpet parameter: 1.5 / 1.0 mSv

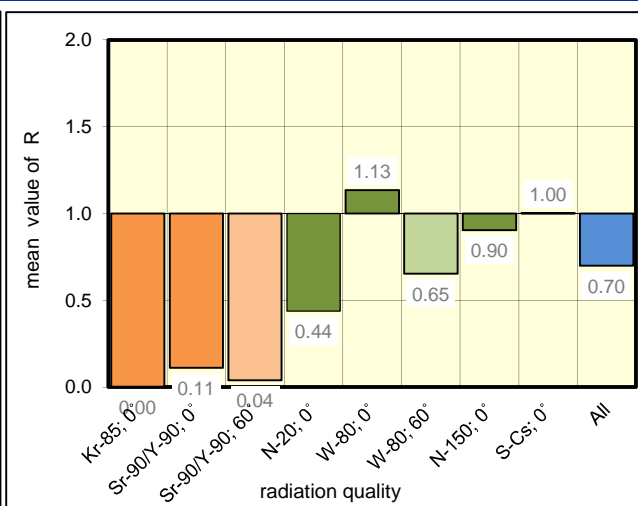
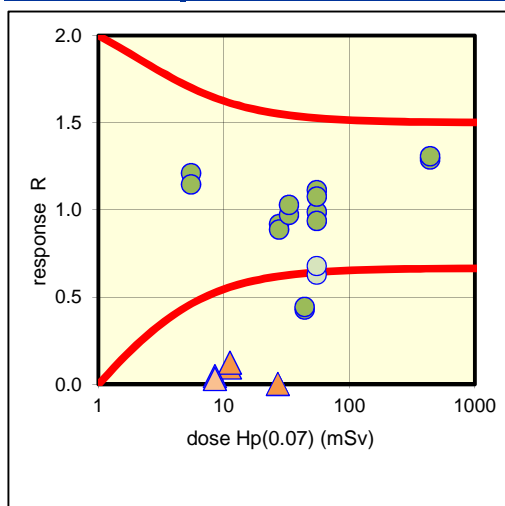
## system 30 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	27.00	0.076	0.00	(outlier)
		22	27.00	0.082	0.00	(outlier)
	Sr-90/Y-90; 0°	17	11.20	1.090	0.10	(outlier)
		18	11.20	1.401	0.13	(outlier)
		19	8.50	0.406	0.05	(outlier)
Sr-90/Y-90; 60°	20	8.50	0.262	0.03	(outlier)	
	N-20; 0°	11	44.00	18.930	<b>0.43</b>	outlier
		12	44.00	19.520	<b>0.44</b>	outlier
Photon	W-80; 0°	01	5.48	6.632	<b>1.21</b>	OK
		02	5.48	6.285	<b>1.15</b>	OK
		03	55.20	54.640	<b>0.99</b>	OK
		04	55.20	61.510	<b>1.11</b>	OK
		05	55.20	59.450	<b>1.08</b>	OK
		06	55.20	51.730	<b>0.94</b>	OK
		09	440.00	567.300	<b>1.29</b>	OK
		10	440.00	575.600	<b>1.31</b>	OK
	W-80; 60°	07	55.10	34.690	<b>0.63</b>	outlier
		08	55.10	37.370	<b>0.68</b>	OK
	N-150; 0°	13	27.50	25.260	<b>0.92</b>	OK
		14	27.50	24.430	<b>0.89</b>	OK
	S-Cs; 0°	15	33.00	32.100	<b>0.97</b>	OK
16		33.00	33.980	<b>1.03</b>	OK	
	NIR	23		0.000		
	NIR	24		0.000		
	NIR	25		0.000		
	NIR	26		0.000		
	NIR	27		0.000		
	NIR	28		0.000		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.00	0.00	0.00	0.00	5%
Sr-90/Y-90; 0°	2	0.11	0.11	0.13	0.10	18%
Sr-90/Y-90; 60°	2	0.04	0.04	0.05	0.03	30%
Beta all	6	0.04	0.05	0.13	0.00	98%
N-20; 0°	2	0.44	0.44	0.44	0.43	2%
W-80; 0°	8	1.13	1.13	1.31	0.94	12%
W-80; 60°	2	0.65	0.65	0.68	0.63	5%
N-150; 0°	2	0.90	0.90	0.92	0.89	2%
S-Cs; 0°	2	1.00	1.00	1.03	0.97	4%
Photon all	16	0.98	0.94	1.31	0.43	29%
All	22	0.90	0.70	1.31	0.00	67%

**outliers: 3 of 16**

**fraction of outliers: 19%**



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv



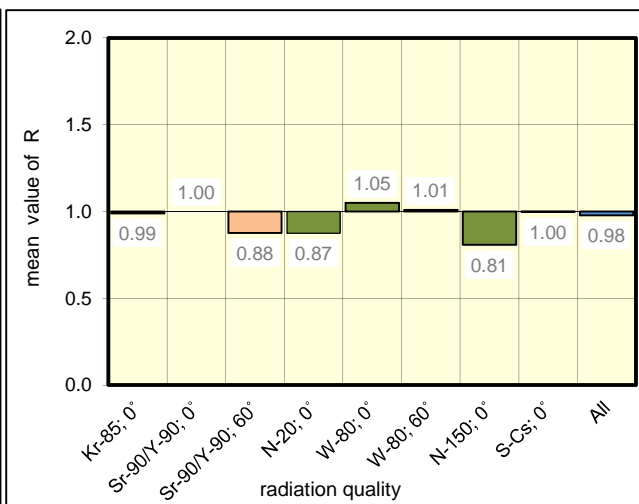
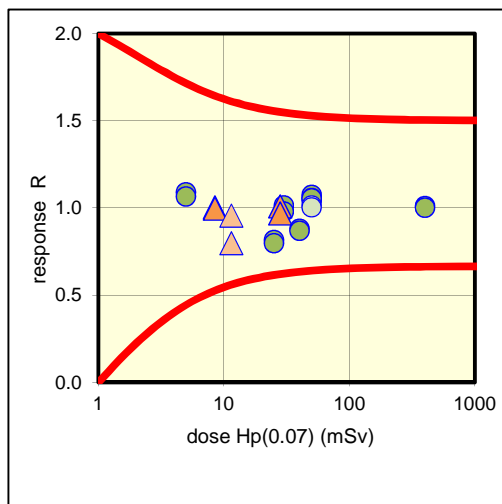
## system 31 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	28.20	28.47	<b>1.01</b>	OK
		22	28.20	27.32	<b>0.97</b>	OK
	Sr-90/Y-90; 0°	17	8.50	8.53	<b>1.00</b>	OK
		18	8.50	8.47	<b>1.00</b>	OK
		19	11.50	11.00	<b>0.96</b>	OK
Sr-90/Y-90; 60°	20	11.50	9.17	<b>0.80</b>	OK	
Photon	N-20; 0°	11	40.00	35.20	<b>0.88</b>	OK
		12	40.00	34.78	<b>0.87</b>	OK
	W-80; 0°	01	4.98	5.43	<b>1.09</b>	OK
		02	4.98	5.31	<b>1.07</b>	OK
		03	50.10	52.29	<b>1.04</b>	OK
		04	50.10	53.82	<b>1.07</b>	OK
		05	50.10	52.97	<b>1.06</b>	OK
		06	50.10	52.84	<b>1.05</b>	OK
		09	400.00	404.4	<b>1.01</b>	OK
	10	400.00	400.4	<b>1.00</b>	OK	
	W-80; 60°	07	50.10	50.86	<b>1.02</b>	OK
		08	50.10	50.24	<b>1.00</b>	OK
	N-150; 0°	13	25.00	20.40	<b>0.82</b>	OK
		14	25.00	19.96	<b>0.80</b>	OK
S-Cs; 0°	15	30.00	30.44	<b>1.01</b>	OK	
	16	30.00	29.40	<b>0.98</b>	OK	
	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
	NIR	28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.99	0.99	1.01	0.97	3%
Sr-90/Y-90; 0°	2	1.00	1.00	1.00	1.00	0%
Sr-90/Y-90; 60°	2	0.88	0.88	0.96	0.80	13%
Beta all	<b>6</b>	<b>0.98</b>	<b>0.96</b>	<b>1.01</b>	<b>0.80</b>	<b>8%</b>
N-20; 0°	2	0.87	0.87	0.88	0.87	1%
W-80; 0°	8	1.06	1.05	1.09	1.00	3%
W-80; 60°	2	1.01	1.01	1.02	1.00	1%
N-150; 0°	2	0.81	0.81	0.82	0.80	2%
S-Cs; 0°	2	1.00	1.00	1.01	0.98	2%
Photon all	<b>16</b>	<b>1.01</b>	<b>0.99</b>	<b>1.09</b>	<b>0.80</b>	<b>9%</b>
All	<b>22</b>	<b>1.00</b>	<b>0.98</b>	<b>1.09</b>	<b>0.80</b>	<b>9%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

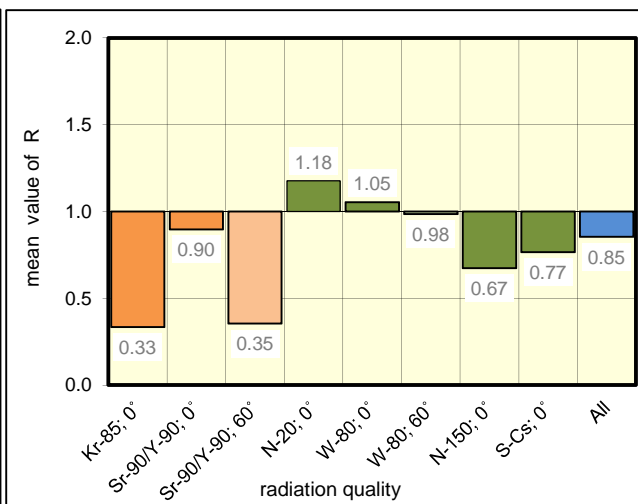
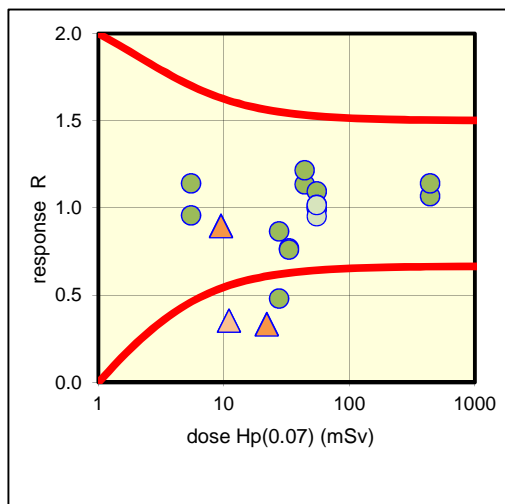
## system 32 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.00	7.40	<b>0.34</b>	outlier
		22	22.00	7.30	<b>0.33</b>	outlier
	Sr-90/Y-90; 0°	17	9.50	8.55	<b>0.90</b>	OK
		18	9.50	8.50	<b>0.89</b>	OK
		19	11.00	3.90	<b>0.35</b>	outlier
Sr-90/Y-90; 60°	20	11.00	3.90	<b>0.35</b>	outlier	
Photon	N-20; 0°	11	44.00	50.00	<b>1.14</b>	OK
		12	44.00	53.50	<b>1.22</b>	OK
	W-80; 0°	01	5.48	6.25	<b>1.14</b>	OK
		02	5.48	5.25	<b>0.96</b>	OK
		03	55.20	55.25	<b>1.00</b>	OK
		04	55.20	60.45	<b>1.10</b>	OK
		05	55.20	54.95	<b>1.00</b>	OK
		06	55.20	56.25	<b>1.02</b>	OK
		09	440.00	469.90	<b>1.07</b>	OK
		10	440.00	502.45	<b>1.14</b>	OK
	W-80; 60°	07	55.10	52.45	<b>0.95</b>	OK
		08	55.10	56.05	<b>1.02</b>	OK
	N-150; 0°	13	27.50	13.25	<b>0.48</b>	outlier
		14	27.50	23.80	<b>0.87</b>	OK
S-Cs; 0°	15	33.00	25.40	<b>0.77</b>	OK	
	16	33.00	25.15	<b>0.76</b>	OK	
NIR	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
NIR	28		0.00			

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.33	0.33	0.34	0.33	1%
Sr-90/Y-90; 0°	2	0.90	0.90	0.90	0.89	0%
Sr-90/Y-90; 60°	2	0.35	0.35	0.35	0.35	0%
<b>Beta all</b>	<b>6</b>	<b>0.35</b>	<b>0.53</b>	<b>0.90</b>	<b>0.33</b>	<b>54%</b>
N-20; 0°	2	1.18	1.18	1.22	1.14	5%
W-80; 0°	8	1.04	1.05	1.14	0.96	7%
W-80; 60°	2	0.98	0.98	1.02	0.95	5%
N-150; 0°	2	0.67	0.67	0.87	0.48	40%
S-Cs; 0°	2	0.77	0.77	0.77	0.76	1%
<b>Photon all</b>	<b>16</b>	<b>1.01</b>	<b>0.98</b>	<b>1.22</b>	<b>0.48</b>	<b>19%</b>
<b>All</b>	<b>22</b>	<b>0.95</b>	<b>0.85</b>	<b>1.22</b>	<b>0.33</b>	<b>34%</b>

outliers: 5 of 22

fraction of outliers: 23%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

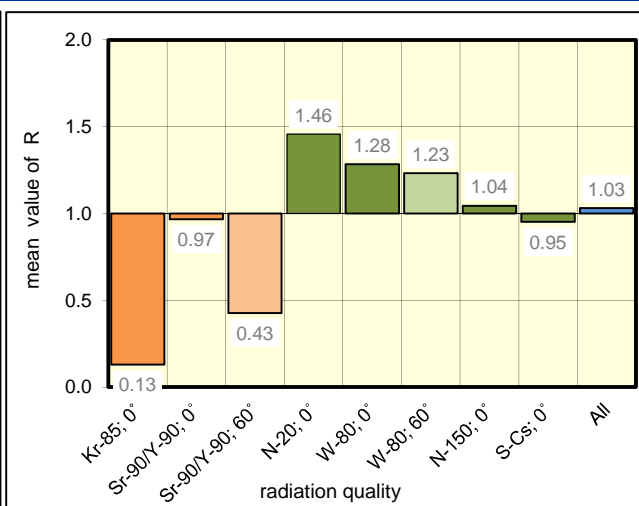
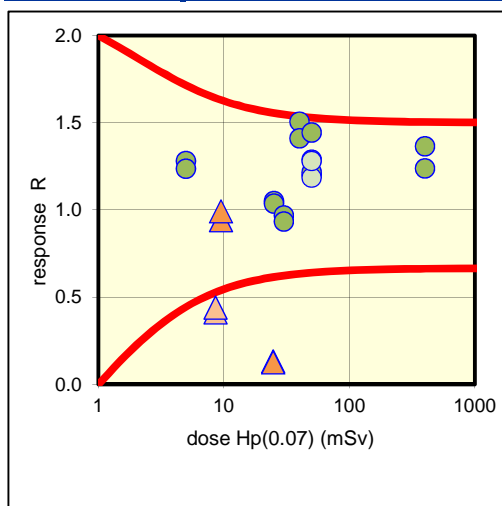
## system 33 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	24.80	3.28	0.13	(outlier)
		22	24.80	3.12	0.13	(outlier)
	Sr-90/Y-90; 0°	17	9.50	8.94	0.94	(OK)
		18	9.50	9.42	0.99	(OK)
		19	8.60	3.55	0.41	(outlier)
Sr-90/Y-90; 60°	20	8.60	3.79	0.44	(outlier)	
	N-20; 0°	11	40.00	60.22	<b>1.51</b>	OK
12		40.00	56.41	<b>1.41</b>	OK	
Photon	W-80; 0°	01	4.98	6.38	<b>1.28</b>	OK
		02	4.98	6.16	<b>1.24</b>	OK
		03	50.10	64.54	<b>1.29</b>	OK
		04	50.10	72.34	<b>1.44</b>	OK
		05	50.10	60.15	<b>1.20</b>	OK
		06	50.10	60.95	<b>1.22</b>	OK
		09	400.00	495.40	<b>1.24</b>	OK
	10	400.00	545.73	<b>1.36</b>	OK	
	W-80; 60°	07	50.10	59.34	<b>1.18</b>	OK
		08	50.10	64.11	<b>1.28</b>	OK
	N-150; 0°	13	25.00	26.30	<b>1.05</b>	OK
		14	25.00	25.92	<b>1.04</b>	OK
	S-Cs; 0°	15	30.00	29.04	<b>0.97</b>	OK
16		30.00	28.03	<b>0.93</b>	OK	
NIR	NIR	23		0.00		
	NIR	24		0.01		
	NIR	25		0.00		
	NIR	26		0.01		
	NIR	27		0.00		
	NIR	28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.13	0.13	0.13	0.13	4%
Sr-90/Y-90; 0°	2	0.97	0.97	0.99	0.94	4%
Sr-90/Y-90; 60°	2	0.43	0.43	0.44	0.41	5%
Beta all	6	0.43	0.51	0.99	0.13	75%
N-20; 0°	2	1.46	1.46	1.51	1.41	5%
W-80; 0°	8	1.26	1.28	1.44	1.20	6%
W-80; 60°	2	1.23	1.23	1.28	1.18	5%
N-150; 0°	2	1.04	1.04	1.05	1.04	1%
S-Cs; 0°	2	0.95	0.95	0.97	0.93	3%
Photon all	16	1.24	1.23	1.51	0.93	13%
All	22	1.19	1.03	1.51	0.13	39%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

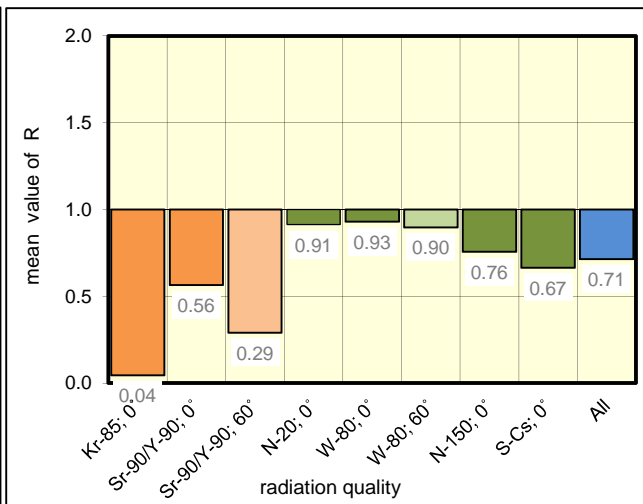
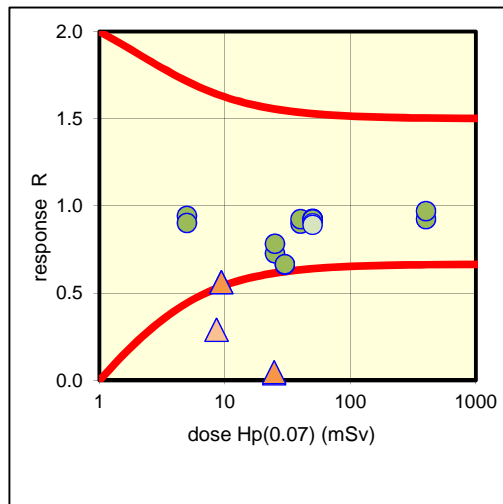
## system 34 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	24.80	1.0	<b>0.04</b>	outlier
		22	24.80	1.2	<b>0.05</b>	outlier
	Sr-90/Y-90; 0°	17	9.40	5.3	<b>0.56</b>	OK
		18	9.40	5.3	<b>0.56</b>	OK
	Sr-90/Y-90; 60°	19	8.60	2.5	<b>0.29</b>	outlier
20		8.60	2.5	<b>0.29</b>	outlier	
Photon	N-20; 0°	11	40.00	36.0	<b>0.90</b>	OK
		12	40.00	37.0	<b>0.93</b>	OK
	W-80; 0°	01	4.98	4.7	<b>0.94</b>	OK
		02	4.98	4.5	<b>0.90</b>	OK
		03	50.20	46.3	<b>0.92</b>	OK
		04	50.20	46.5	<b>0.93</b>	OK
		05	50.20	46.3	<b>0.92</b>	OK
		06	50.20	46.3	<b>0.92</b>	OK
		09	400.00	370.0	<b>0.93</b>	OK
	10	400.00	388.4	<b>0.97</b>	OK	
	W-80; 60°	07	50.10	45.1	<b>0.90</b>	OK
		08	50.10	44.7	<b>0.89</b>	OK
	N-150; 0°	13	25.00	18.2	<b>0.73</b>	OK
		14	25.00	19.6	<b>0.78</b>	OK
S-Cs; 0°	15	30.00	19.9	<b>0.66</b>	OK	
	16	30.00	20.0	<b>0.67</b>	OK	
NIR	NIR	23		0.0		
	NIR	24		0.0		
	NIR	25		0.0		
	NIR	26		0.0		
	NIR	27		0.0		
	NIR	28		0.0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.04	0.04	0.05	0.04	13%
Sr-90/Y-90; 0°	2	0.56	0.56	0.56	0.56	0%
Sr-90/Y-90; 60°	2	0.29	0.29	0.29	0.29	0%
<b>Beta all</b>	<b>6</b>	<b>0.29</b>	<b>0.30</b>	<b>0.56</b>	<b>0.04</b>	<b>78%</b>
N-20; 0°	2	0.91	0.91	0.93	0.90	2%
W-80; 0°	8	0.92	0.93	0.97	0.90	2%
W-80; 60°	2	0.90	0.90	0.90	0.89	1%
N-150; 0°	2	0.76	0.76	0.78	0.73	5%
S-Cs; 0°	2	0.67	0.67	0.67	0.66	0%
<b>Photon all</b>	<b>16</b>	<b>0.91</b>	<b>0.87</b>	<b>0.97</b>	<b>0.66</b>	<b>11%</b>
<b>All</b>	<b>22</b>	<b>0.90</b>	<b>0.71</b>	<b>0.97</b>	<b>0.04</b>	<b>41%</b>

outliers: 4 of 22

fraction of outliers: 18%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

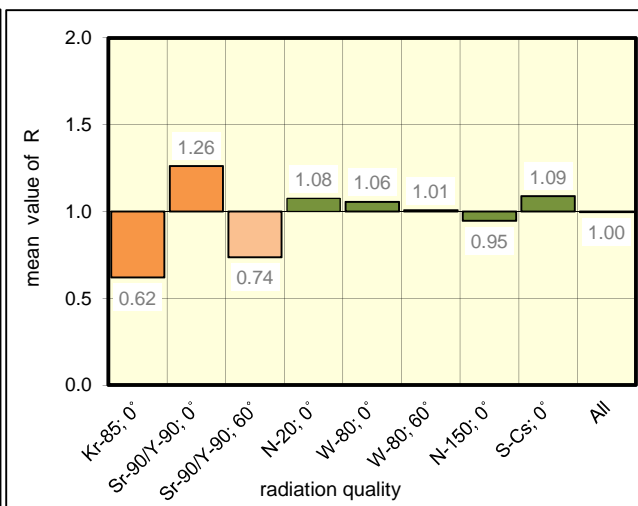
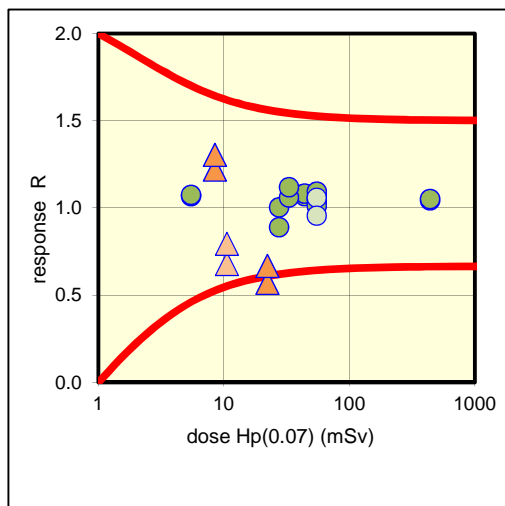
## system 35 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.30	12.73	<b>0.57</b>	outlier
		22	22.30	14.89	<b>0.67</b>	OK
	Sr-90/Y-90; 0°	17	8.50	10.37	<b>1.22</b>	OK
		18	8.50	11.09	<b>1.30</b>	OK
		19	10.60	7.20	<b>0.68</b>	OK
Sr-90/Y-90; 60°	20	10.60	8.41	<b>0.79</b>	OK	
Photon	N-20; 0°	11	44.00	46.99	<b>1.07</b>	OK
		12	44.00	47.62	<b>1.08</b>	OK
	W-80; 0°	01	5.48	5.85	<b>1.07</b>	OK
		02	5.48	5.89	<b>1.08</b>	OK
		03	55.20	57.62	<b>1.04</b>	OK
		04	55.20	58.53	<b>1.06</b>	OK
		05	55.20	60.36	<b>1.09</b>	OK
		06	55.20	55.91	<b>1.01</b>	OK
		09	440.00	459.05	<b>1.04</b>	OK
	10	440.00	462.61	<b>1.05</b>	OK	
	W-80; 60°	07	55.10	58.32	<b>1.06</b>	OK
		08	55.10	52.68	<b>0.96</b>	OK
	N-150; 0°	13	27.50	24.46	<b>0.89</b>	OK
		14	27.50	27.61	<b>1.00</b>	OK
S-Cs; 0°	15	33.00	34.97	<b>1.06</b>	OK	
	16	33.00	36.91	<b>1.12</b>	OK	
	NIR	23				
	NIR	24				
	NIR	25				
	NIR	26				
	NIR	27				
	NIR	28				

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.62	0.62	0.67	0.57	11%
Sr-90/Y-90; 0°	2	1.26	1.26	1.30	1.22	5%
Sr-90/Y-90; 60°	2	0.74	0.74	0.79	0.68	11%
Beta all	<b>6</b>	<b>0.74</b>	<b>0.87</b>	<b>1.30</b>	<b>0.57</b>	<b>36%</b>
N-20; 0°	2	1.08	1.08	1.08	1.07	1%
W-80; 0°	8	1.06	1.06	1.09	1.01	2%
W-80; 60°	2	1.01	1.01	1.06	0.96	7%
N-150; 0°	2	0.95	0.95	1.00	0.89	9%
S-Cs; 0°	2	1.09	1.09	1.12	1.06	4%
Photon all	<b>16</b>	<b>1.06</b>	<b>1.04</b>	<b>1.12</b>	<b>0.89</b>	<b>5%</b>
All	<b>22</b>	<b>1.05</b>	<b>1.00</b>	<b>1.30</b>	<b>0.57</b>	<b>18%</b>

outliers: 1 of 22

fraction of outliers: 5%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

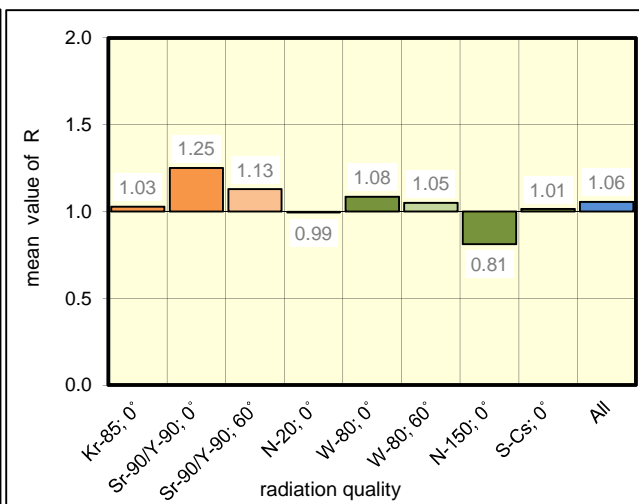
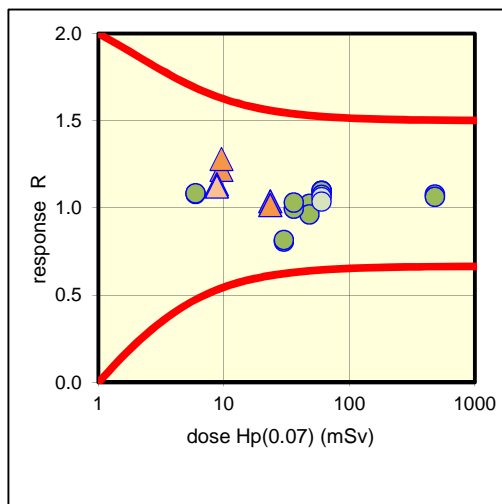
## system 36 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.50	24.4	<b>1.04</b>	OK
		22	23.50	23.9	<b>1.02</b>	OK
	Sr-90/Y-90; 0°	17	9.60	11.7	<b>1.22</b>	OK
		18	9.60	12.3	<b>1.28</b>	OK
		19	8.80	9.99	<b>1.14</b>	OK
Sr-90/Y-90; 60°	20	8.80	9.88	<b>1.12</b>	OK	
Photon	N-20; 0°	11	48.00	49.1	<b>1.02</b>	OK
		12	48.00	46.2	<b>0.96</b>	OK
	W-80; 0°	01	5.96	6.44	<b>1.08</b>	OK
		02	5.96	6.46	<b>1.08</b>	OK
		03	60.20	66.2	<b>1.10</b>	OK
		04	60.20	66.0	<b>1.10</b>	OK
		05	60.20	66.1	<b>1.10</b>	OK
		06	60.20	64.7	<b>1.07</b>	OK
		09	480.00	517	<b>1.08</b>	OK
	10	480.00	511	<b>1.06</b>	OK	
	W-80; 60°	07	60.10	63.8	<b>1.06</b>	OK
		08	60.10	62.3	<b>1.04</b>	OK
	N-150; 0°	13	30.10	24.3	<b>0.81</b>	OK
		14	30.10	24.6	<b>0.82</b>	OK
	S-Cs; 0°	15	36.00	35.9	<b>1.00</b>	OK
16		36.00	37.1	<b>1.03</b>	OK	
NIR	NIR	23		0		
	NIR	24		0		
	NIR	25		0		
	NIR	26		0		
	NIR	27		0		
	NIR	28		0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	1.03	1.03	1.04	1.02	1%
Sr-90/Y-90; 0°	2	1.25	1.25	1.28	1.22	4%
Sr-90/Y-90; 60°	2	1.13	1.13	1.14	1.12	1%
Beta all	<b>6</b>	<b>1.13</b>	<b>1.14</b>	<b>1.28</b>	<b>1.02</b>	<b>9%</b>
N-20; 0°	2	0.99	0.99	1.02	0.96	4%
W-80; 0°	8	1.08	1.08	1.10	1.06	1%
W-80; 60°	2	1.05	1.05	1.06	1.04	2%
N-150; 0°	2	0.81	0.81	0.82	0.81	1%
S-Cs; 0°	2	1.01	1.01	1.03	1.00	2%
Photon all	<b>16</b>	<b>1.06</b>	<b>1.03</b>	<b>1.10</b>	<b>0.81</b>	<b>9%</b>
All	<b>22</b>	<b>1.07</b>	<b>1.06</b>	<b>1.28</b>	<b>0.81</b>	<b>10%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

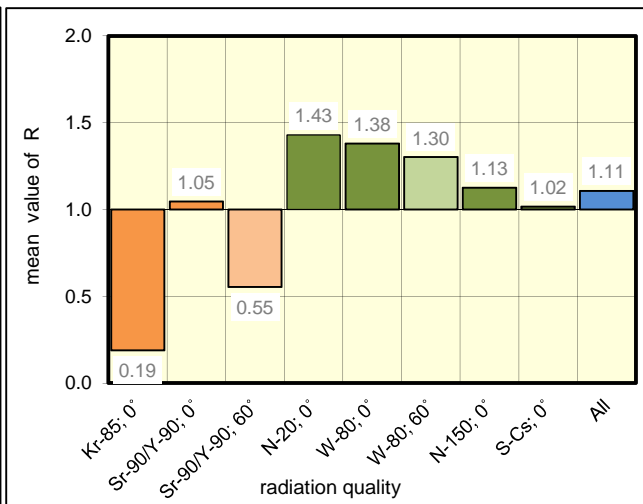
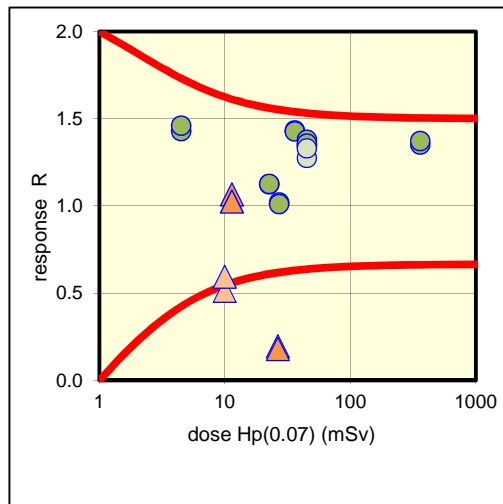
## system 37 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.50	5.19	0.20	(outlier)
		22	26.50	4.78	0.18	(outlier)
	Sr-90/Y-90; 0°	17	11.40	12.16	1.07	(OK)
		18	11.40	11.69	1.03	(OK)
		19	10.00	5.13	0.51	(outlier)
Sr-90/Y-90; 60°	20	10.00	5.95	0.60	(OK)	
	Photon	N-20; 0°	11	36.00	51.56	<b>1.43</b>
12			36.00	51.37	<b>1.43</b>	OK
W-80; 0°		01	4.48	6.40	<b>1.43</b>	OK
		02	4.48	6.54	<b>1.46</b>	OK
		03	45.10	60.44	<b>1.34</b>	OK
		04	45.10	62.18	<b>1.38</b>	OK
		05	45.10	61.01	<b>1.35</b>	OK
		06	45.10	61.24	<b>1.36</b>	OK
		09	361.00	488.26	<b>1.35</b>	OK
10		361.00	495.06	<b>1.37</b>	OK	
W-80; 60°		07	45.10	57.49	<b>1.27</b>	OK
	08	45.10	60.02	<b>1.33</b>	OK	
N-150; 0°	13	22.50	25.31	<b>1.12</b>	OK	
	14	22.50	25.36	<b>1.13</b>	OK	
S-Cs; 0°	15	27.00	27.54	<b>1.02</b>	OK	
	16	27.00	27.31	<b>1.01</b>	OK	
	NIR	23		<0.1		
	NIR	24		<0.1		
	NIR	25		<0.1		
	NIR	26		<0.1		
	NIR	27		<0.1		
	NIR	28		<0.1		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.19	0.19	0.20	0.18	6%
Sr-90/Y-90; 0°	2	1.05	1.05	1.07	1.03	3%
Sr-90/Y-90; 60°	2	0.55	0.55	0.60	0.51	10%
Beta all	6	0.55	0.60	1.07	0.18	65%
N-20; 0°	2	1.43	1.43	1.43	1.43	0%
W-80; 0°	8	1.36	1.38	1.46	1.34	3%
W-80; 60°	2	1.30	1.30	1.33	1.27	3%
N-150; 0°	2	1.13	1.13	1.13	1.12	0%
S-Cs; 0°	2	1.02	1.02	1.02	1.01	1%
Photon all	16	1.35	1.30	1.46	1.01	11%
All	22	1.30	1.11	1.46	0.18	35%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

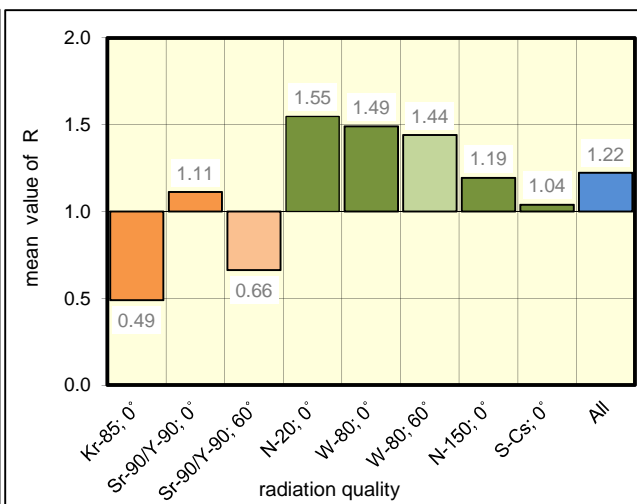
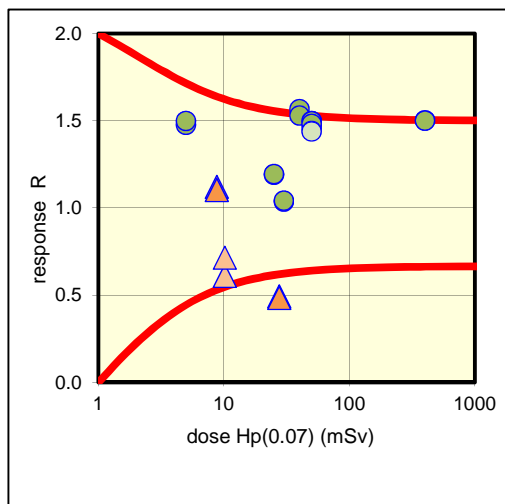
## system 38 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	27.70	13.66	<b>0.49</b>	outlier
		22	27.70	13.43	<b>0.48</b>	outlier
	Sr-90/Y-90; 0°	17	8.80	9.86	<b>1.12</b>	OK
		18	8.80	9.70	<b>1.10</b>	OK
		19	10.20	6.23	<b>0.61</b>	OK
Sr-90/Y-90; 60°	20	10.20	7.29	<b>0.71</b>	OK	
Photon	N-20; 0°	11	40.00	62.66	<b>1.57</b>	outlier
		12	40.00	61.17	<b>1.53</b>	OK
	W-80; 0°	01	4.98	7.35	<b>1.48</b>	OK
		02	4.98	7.46	<b>1.50</b>	OK
		03	50.20	73.52	<b>1.46</b>	OK
		04	50.20	75.27	<b>1.50</b>	OK
		05	50.20	75.12	<b>1.50</b>	OK
		06	50.20	74.41	<b>1.48</b>	OK
		09	400.00	600.68	<b>1.50</b>	OK
		10	400.00	600.11	<b>1.50</b>	OK
	W-80; 60°	07	50.10	72.28	<b>1.44</b>	OK
		08	50.10	72.06	<b>1.44</b>	OK
	N-150; 0°	13	25.00	29.79	<b>1.19</b>	OK
		14	25.00	29.87	<b>1.19</b>	OK
	S-Cs; 0°	15	30.00	31.09	<b>1.04</b>	OK
16		30.00	31.27	<b>1.04</b>	OK	
	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
	NIR	28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.49	0.49	0.49	0.48	1%
Sr-90/Y-90; 0°	2	1.11	1.11	1.12	1.10	1%
Sr-90/Y-90; 60°	2	0.66	0.66	0.71	0.61	11%
<b>Beta all</b>	<b>6</b>	<b>0.66</b>	<b>0.75</b>	<b>1.12</b>	<b>0.48</b>	<b>38%</b>
N-20; 0°	2	1.55	1.55	1.57	1.53	2%
W-80; 0°	8	1.50	1.49	1.50	1.46	1%
W-80; 60°	2	1.44	1.44	1.44	1.44	0%
N-150; 0°	2	1.19	1.19	1.19	1.19	0%
S-Cs; 0°	2	1.04	1.04	1.04	1.04	0%
<b>Photon all</b>	<b>16</b>	<b>1.48</b>	<b>1.40</b>	<b>1.57</b>	<b>1.04</b>	<b>13%</b>
<b>All</b>	<b>22</b>	<b>1.44</b>	<b>1.22</b>	<b>1.57</b>	<b>0.48</b>	<b>29%</b>

outliers: 3 of 22

fraction of outliers: 14%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv



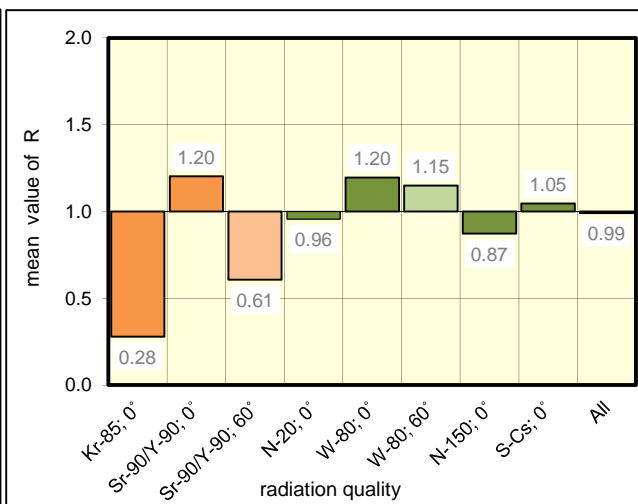
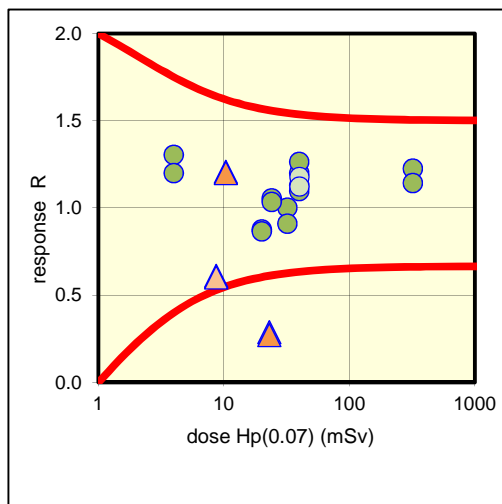
## system 39 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.10	6.64	<b>0.29</b>	outlier outlier
		22	23.10	6.28	<b>0.27</b>	
	Sr-90/Y-90; 0°	17	10.40	12.55	<b>1.21</b>	OK
		18	10.40	12.47	<b>1.20</b>	OK
		19	8.70	5.31	<b>0.61</b>	OK
Sr-90/Y-90; 60°	20	8.70	5.24	<b>0.60</b>	OK	
	Photon	N-20; 0°	11	32.10	32.13	<b>1.00</b>
12			32.10	29.24	<b>0.91</b>	OK
W-80; 0°		01	4.00	5.22	<b>1.31</b>	OK
		02	4.00	4.80	<b>1.20</b>	OK
		03	39.90	47.91	<b>1.20</b>	OK
		04	39.90	43.81	<b>1.10</b>	OK
		05	39.90	45.08	<b>1.13</b>	OK
		06	39.90	50.41	<b>1.26</b>	OK
		09	320.00	392.28	<b>1.23</b>	OK
10		320.00	365.56	<b>1.14</b>	OK	
W-80; 60°		07	40.00	47.10	<b>1.18</b>	OK
		08	40.00	44.88	<b>1.12</b>	OK
N-150; 0°		13	20.00	17.53	<b>0.88</b>	OK
		14	20.00	17.34	<b>0.87</b>	OK
S-Cs; 0°		15	24.00	25.33	<b>1.06</b>	OK
		16	24.00	24.83	<b>1.03</b>	OK
	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
	NIR	28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.28	0.28	0.29	0.27	4%
Sr-90/Y-90; 0°	2	1.20	1.20	1.21	1.20	0%
Sr-90/Y-90; 60°	2	0.61	0.61	0.61	0.60	1%
Beta all	<b>6</b>	<b>0.61</b>	<b>0.70</b>	<b>1.21</b>	<b>0.27</b>	<b>60%</b>
N-20; 0°	2	0.96	0.96	1.00	0.91	7%
W-80; 0°	8	1.20	1.20	1.31	1.10	6%
W-80; 60°	2	1.15	1.15	1.18	1.12	3%
N-150; 0°	2	0.87	0.87	0.88	0.87	1%
S-Cs; 0°	2	1.05	1.05	1.06	1.03	1%
Photon all	<b>16</b>	<b>1.13</b>	<b>1.10</b>	<b>1.31</b>	<b>0.87</b>	<b>12%</b>
All	<b>22</b>	<b>1.11</b>	<b>0.99</b>	<b>1.31</b>	<b>0.27</b>	<b>30%</b>

outliers: 2 of 22

fraction of outliers: 9%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

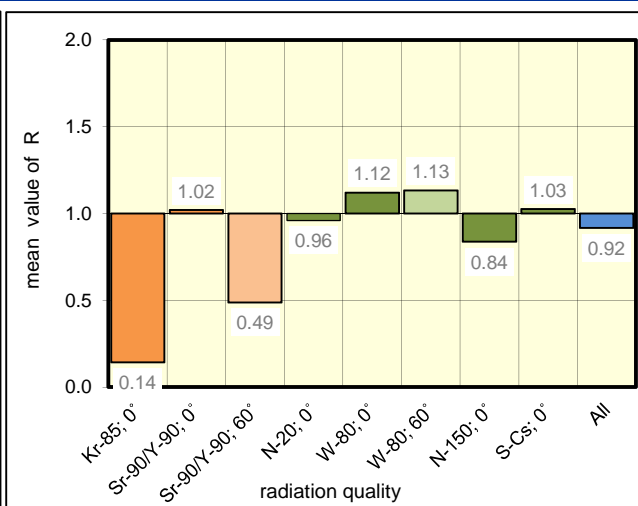
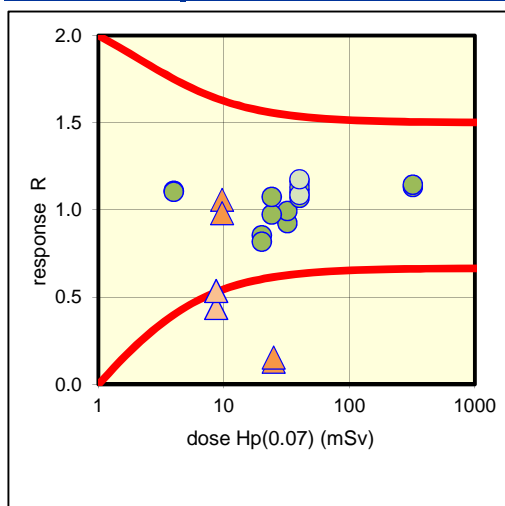
## system 40 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result		
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)		
Beta	Kr-85; 0°	21	25.00	3.249	0.13	(outlier)	
		22	25.00	3.859	0.15	(outlier)	
	Sr-90/Y-90; 0°	17	9.70	10.26	1.06	(OK)	
		18	9.70	9.518	0.98	(OK)	
		19	8.70	3.821	0.44	(outlier)	
Sr-90/Y-90; 60°	20	8.70	4.667	0.54	(OK)		
	N-20; 0°	11	32.10	29.70	<b>0.93</b>	OK	
		12	32.10	31.93	<b>0.99</b>	OK	
Photon	W-80; 0°	01	4.00	4.442	<b>1.11</b>	OK	
		02	4.00	4.420	<b>1.11</b>	OK	
		03	40.00	44.11	<b>1.10</b>	OK	
		04	40.00	46.59	<b>1.16</b>	OK	
		05	40.00	42.81	<b>1.07</b>	OK	
		06	40.00	45.20	<b>1.13</b>	OK	
		09	320.00	362.1	<b>1.13</b>	OK	
		10	320.00	366.4	<b>1.15</b>	OK	
		W-80; 60°	07	40.00	43.46	<b>1.09</b>	OK
			08	40.00	47.07	<b>1.18</b>	OK
	N-150; 0°	13	20.00	17.10	<b>0.86</b>	OK	
		14	20.00	16.37	<b>0.82</b>	OK	
	S-Cs; 0°	15	24.00	23.39	<b>0.97</b>	OK	
16		24.00	25.82	<b>1.08</b>	OK		
NIR		23		0.000			
		24		0.000			
		25		0.000			
		26		0.000			
		27		0.000			
		28		0.000			

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.14	0.14	0.15	0.13	12%
Sr-90/Y-90; 0°	2	1.02	1.02	1.06	0.98	5%
Sr-90/Y-90; 60°	2	0.49	0.49	0.54	0.44	14%
Beta all	6	0.49	0.55	1.06	0.13	72%
N-20; 0°	2	0.96	0.96	0.99	0.93	5%
W-80; 0°	8	1.12	1.12	1.16	1.07	3%
W-80; 60°	2	1.13	1.13	1.18	1.09	6%
N-150; 0°	2	0.84	0.84	0.86	0.82	3%
S-Cs; 0°	2	1.03	1.03	1.08	0.97	7%
Photon all	16	1.09	1.05	1.18	0.82	10%
All	22	1.06	0.92	1.18	0.13	34%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

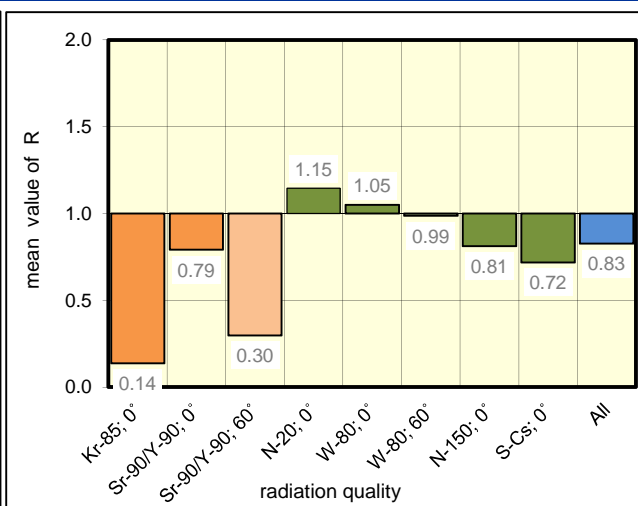
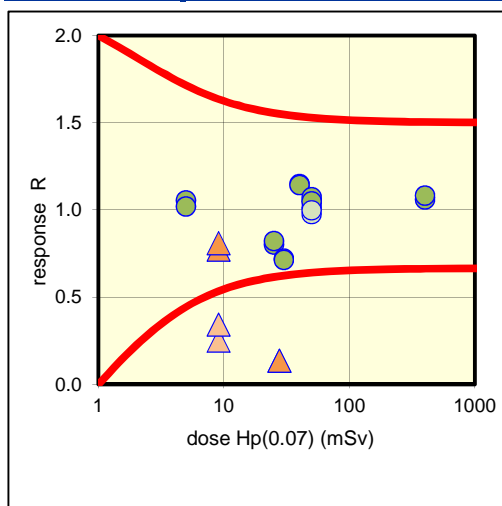
## system 41 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	27.80	3.79	0.14	(outlier)
		22	27.80	3.80	0.14	(outlier)
	Sr-90/Y-90; 0°	17	9.10	7.03	0.77	(OK)
		18	9.10	7.37	0.81	(OK)
		19	9.10	2.28	0.25	(outlier)
Sr-90/Y-90; 60°	20	9.10	3.12	0.34	(outlier)	
	Photon	N-20; 0°	11	40.00	45.95	<b>1.15</b>
12			40.00	45.72	<b>1.14</b>	OK
W-80; 0°		01	4.98	5.25	<b>1.05</b>	OK
		02	4.98	5.08	<b>1.02</b>	OK
		03	50.10	50.71	<b>1.01</b>	OK
		04	50.10	52.54	<b>1.05</b>	OK
		05	50.10	53.75	<b>1.07</b>	OK
		06	50.10	52.55	<b>1.05</b>	OK
		09	400.00	424.01	<b>1.06</b>	OK
10		400.00	433.29	<b>1.08</b>	OK	
W-80; 60°	07	50.20	48.95	<b>0.98</b>	OK	
	08	50.20	50.08	<b>1.00</b>	OK	
N-150; 0°	13	25.00	20.03	<b>0.80</b>	OK	
	14	25.00	20.55	<b>0.82</b>	OK	
S-Cs; 0°	15	30.00	21.63	<b>0.72</b>	OK	
	16	30.00	21.44	<b>0.71</b>	OK	
NIR	NIR	23		0.00		
		24		0.00		
		25		0.00		
		26		0.00		
		27		0.00		
		28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.14	0.14	0.14	0.14	0%
Sr-90/Y-90; 0°	2	0.79	0.79	0.81	0.77	3%
Sr-90/Y-90; 60°	2	0.30	0.30	0.34	0.25	22%
Beta all	6	0.30	0.41	0.81	0.14	75%
N-20; 0°	2	1.15	1.15	1.15	1.14	0%
W-80; 0°	8	1.05	1.05	1.08	1.01	2%
W-80; 60°	2	0.99	0.99	1.00	0.98	2%
N-150; 0°	2	0.81	0.81	0.82	0.80	2%
S-Cs; 0°	2	0.72	0.72	0.72	0.71	1%
Photon all	16	1.03	0.98	1.15	0.71	14%
All	22	0.99	0.83	1.15	0.14	39%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

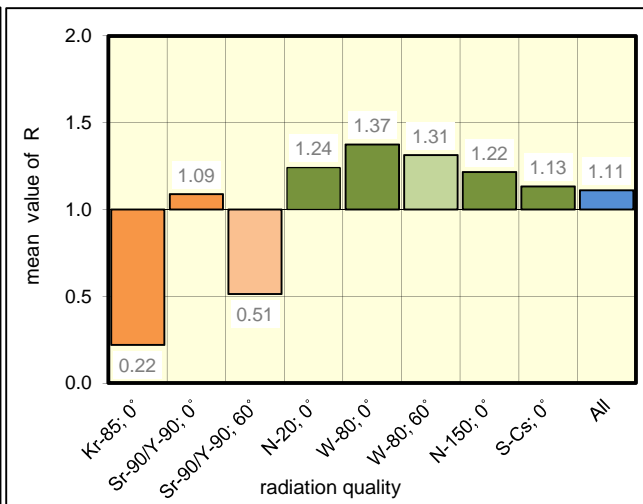
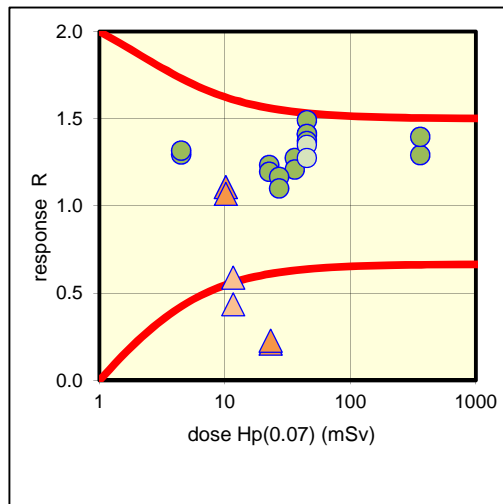
## system 42 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.20	4.9	<b>0.21</b>	outlier
		22	23.20	5.3	<b>0.23</b>	outlier
	Sr-90/Y-90; 0°	17	10.20	11.3	<b>1.11</b>	OK
		18	10.20	10.9	<b>1.07</b>	OK
		19	11.70	6.9	<b>0.59</b>	OK
Sr-90/Y-90; 60°	20	11.70	5.1	<b>0.44</b>	outlier	
	Photon	N-20; 0°	11	36.00	45.9	<b>1.28</b>
12			36.00	43.5	<b>1.21</b>	OK
W-80; 0°		01	4.48	5.8	<b>1.29</b>	OK
		02	4.48	5.9	<b>1.32</b>	OK
		03	45.10	63.6	<b>1.41</b>	OK
		04	45.10	67.3	<b>1.49</b>	OK
		05	45.10	63.7	<b>1.41</b>	OK
		06	45.10	61.9	<b>1.37</b>	OK
		09	361.00	466.3	<b>1.29</b>	OK
		10	361.00	503.9	<b>1.40</b>	OK
W-80; 60°		07	45.10	60.9	<b>1.35</b>	OK
		08	45.10	57.5	<b>1.27</b>	OK
N-150; 0°		13	22.50	27.8	<b>1.24</b>	OK
		14	22.50	26.9	<b>1.20</b>	OK
S-Cs; 0°		15	27.00	31.5	<b>1.17</b>	OK
		16	27.00	29.7	<b>1.10</b>	OK
NIR	NIR	23		0.0		
	NIR	24		0.0		
	NIR	25		0.0		
	NIR	26		0.0		
	NIR	27		0.0		
	NIR	28		0.0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.22	0.22	0.23	0.21	6%
Sr-90/Y-90; 0°	2	1.09	1.09	1.11	1.07	3%
Sr-90/Y-90; 60°	2	0.51	0.51	0.59	0.44	21%
<b>Beta all</b>	<b>6</b>	<b>0.51</b>	<b>0.61</b>	<b>1.11</b>	<b>0.21</b>	<b>66%</b>
N-20; 0°	2	1.24	1.24	1.28	1.21	4%
W-80; 0°	8	1.38	1.37	1.49	1.29	5%
W-80; 60°	2	1.31	1.31	1.35	1.27	4%
N-150; 0°	2	1.22	1.22	1.24	1.20	2%
S-Cs; 0°	2	1.13	1.13	1.17	1.10	4%
<b>Photon all</b>	<b>16</b>	<b>1.29</b>	<b>1.30</b>	<b>1.49</b>	<b>1.10</b>	<b>8%</b>
<b>All</b>	<b>22</b>	<b>1.26</b>	<b>1.11</b>	<b>1.49</b>	<b>0.21</b>	<b>34%</b>

outliers: 3 of 22

fraction of outliers: 14%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

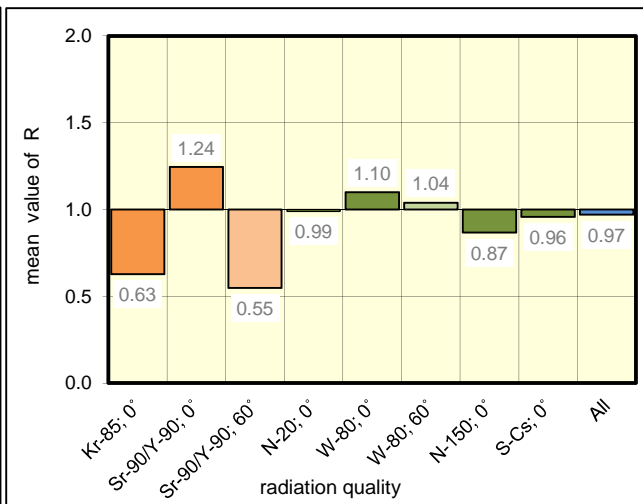
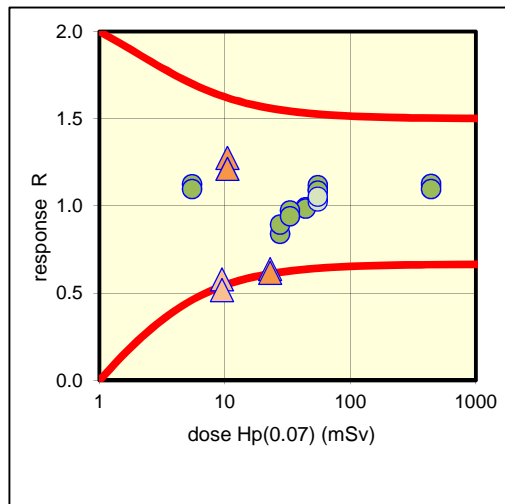
## system 43 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.00	14.68	<b>0.64</b>	OK
		22	23.00	14.17	<b>0.62</b>	OK
	Sr-90/Y-90; 0°	17	10.50	13.40	<b>1.28</b>	OK
		18	10.50	12.73	<b>1.21</b>	OK
		19	9.50	5.50	<b>0.58</b>	OK
20	9.50	4.92	<b>0.52</b>	outlier		
Photon	N-20; 0°	11	44.00	43.68	<b>0.99</b>	OK
		12	44.00	43.32	<b>0.98</b>	OK
	W-80; 0°	01	5.48	6.17	<b>1.13</b>	OK
		02	5.48	6.01	<b>1.10</b>	OK
		03	55.10	60.25	<b>1.09</b>	OK
		04	55.10	61.71	<b>1.12</b>	OK
		05	55.10	57.56	<b>1.04</b>	OK
		06	55.10	59.96	<b>1.09</b>	OK
		09	440.00	495.68	<b>1.13</b>	OK
	10	440.00	482.45	<b>1.10</b>	OK	
	W-80; 60°	07	55.10	56.47	<b>1.02</b>	OK
		08	55.10	58.04	<b>1.05</b>	OK
	N-150; 0°	13	27.50	23.10	<b>0.84</b>	OK
		14	27.50	24.55	<b>0.89</b>	OK
S-Cs; 0°	15	33.00	32.16	<b>0.97</b>	OK	
	16	33.00	31.05	<b>0.94</b>	OK	
NIR	23			0.24		
	24			0.22		
	25			0.26		
	26			0.24		
	27			0.24		
	28			0.24		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.63	0.63	0.64	0.62	2%
Sr-90/Y-90; 0°	2	1.24	1.24	1.28	1.21	4%
Sr-90/Y-90; 60°	2	0.55	0.55	0.58	0.52	8%
<b>Beta all</b>	<b>6</b>	<b>0.63</b>	<b>0.81</b>	<b>1.28</b>	<b>0.52</b>	<b>42%</b>
N-20; 0°	2	0.99	0.99	0.99	0.98	1%
W-80; 0°	8	1.10	1.10	1.13	1.04	2%
W-80; 60°	2	1.04	1.04	1.05	1.02	2%
N-150; 0°	2	0.87	0.87	0.89	0.84	4%
S-Cs; 0°	2	0.96	0.96	0.97	0.94	2%
<b>Photon all</b>	<b>16</b>	<b>1.05</b>	<b>1.03</b>	<b>1.13</b>	<b>0.84</b>	<b>8%</b>
<b>All</b>	<b>22</b>	<b>1.03</b>	<b>0.97</b>	<b>1.28</b>	<b>0.52</b>	<b>22%</b>

outliers: 1 of 22

fraction of outliers: 5%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

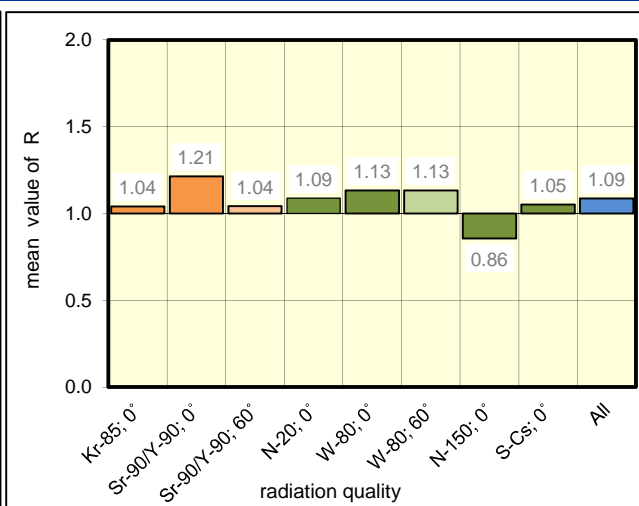
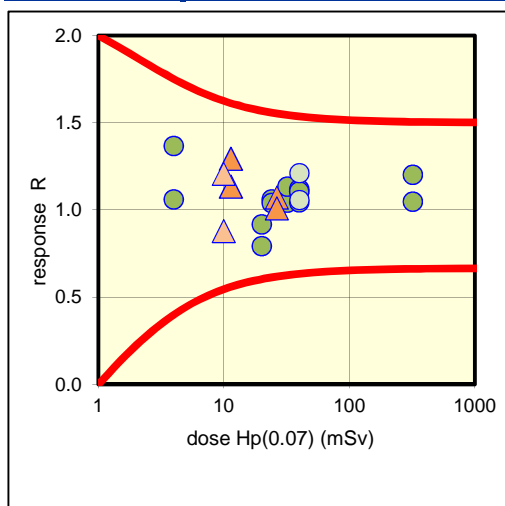
## system 44 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.50	28.367	<b>1.07</b>	OK
		22	26.50	26.756	<b>1.01</b>	OK
	Sr-90/Y-90; 0°	17	11.40	14.737	<b>1.29</b>	OK
		18	11.40	12.919	<b>1.13</b>	OK
		19	10.00	12.063	<b>1.21</b>	OK
Sr-90/Y-90; 60°	20	10.00	8.791	<b>0.88</b>	OK	
Photon	N-20; 0°	11	32.10	33.444	<b>1.04</b>	OK
		12	32.10	36.421	<b>1.13</b>	OK
	W-80; 0°	01	4.00	5.469	<b>1.37</b>	OK
		02	4.00	4.245	<b>1.06</b>	OK
		03	39.90	44.164	<b>1.11</b>	OK
		04	39.90	44.672	<b>1.12</b>	OK
		05	39.90	44.128	<b>1.11</b>	OK
		06	39.90	41.663	<b>1.04</b>	OK
		09	320.00	384.464	<b>1.20</b>	OK
		10	320.00	334.963	<b>1.05</b>	OK
	W-80; 60°	07	40.00	42.255	<b>1.06</b>	OK
		08	40.00	48.406	<b>1.21</b>	OK
	N-150; 0°	13	20.00	18.355	<b>0.92</b>	OK
		14	20.00	15.857	<b>0.79</b>	OK
	S-Cs; 0°	15	24.00	25.473	<b>1.06</b>	OK
16		24.00	24.971	<b>1.04</b>	OK	
NIR	NIR	23		-0.040		
	NIR	24		0.034		
	NIR	25		0.050		
	NIR	26		0.001		
	NIR	27		0.053		
	NIR	28		0.022		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	1.04	1.04	1.07	1.01	4%
Sr-90/Y-90; 0°	2	1.21	1.21	1.29	1.13	9%
Sr-90/Y-90; 60°	2	1.04	1.04	1.21	0.88	22%
Beta all	<b>6</b>	<b>1.10</b>	<b>1.10</b>	<b>1.29</b>	<b>0.88</b>	<b>13%</b>
N-20; 0°	2	1.09	1.09	1.13	1.04	6%
W-80; 0°	8	1.11	1.13	1.37	1.04	10%
W-80; 60°	2	1.13	1.13	1.21	1.06	10%
N-150; 0°	2	0.86	0.86	0.92	0.79	10%
S-Cs; 0°	2	1.05	1.05	1.06	1.04	1%
Photon all	<b>16</b>	<b>1.06</b>	<b>1.08</b>	<b>1.37</b>	<b>0.79</b>	<b>12%</b>
All	<b>22</b>	<b>1.07</b>	<b>1.09</b>	<b>1.37</b>	<b>0.79</b>	<b>12%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

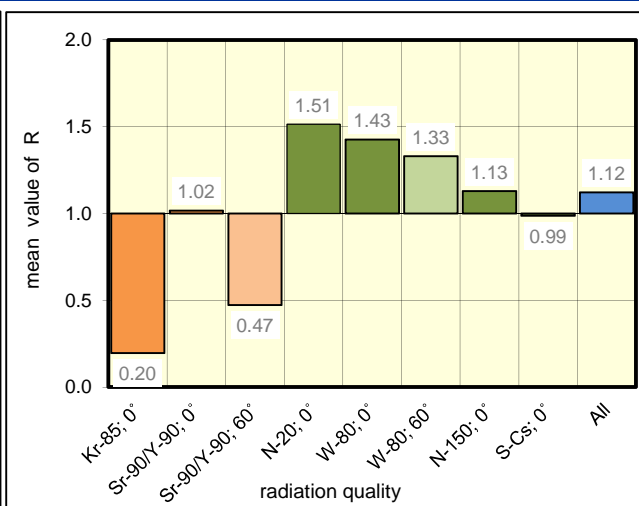
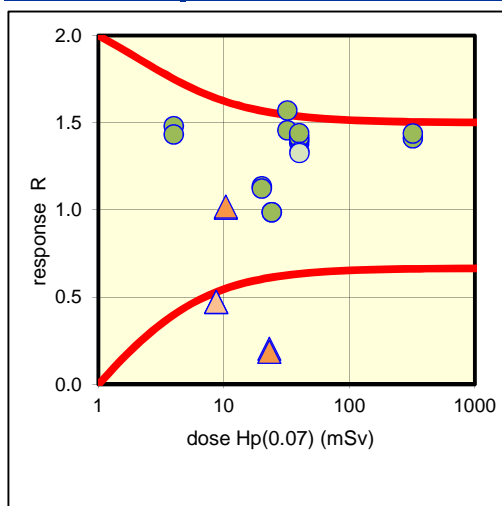
## system 45 : photon dosemeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.10	4.73	0.20	(outlier)
		22	23.10	4.31	0.19	(outlier)
	Sr-90/Y-90; 0°	17	10.40	10.53	1.01	(OK)
		18	10.40	10.60	1.02	(OK)
		19	8.70	4.10	0.47	(outlier)
Sr-90/Y-90; 60°	20	8.70	4.12	0.47	(outlier)	
	N-20; 0°	11	32.10	50.42	<b>1.57</b>	outlier
		12	32.10	46.78	<b>1.46</b>	OK
Photon	W-80; 0°	01	4.00	5.92	<b>1.48</b>	OK
		02	4.00	5.73	<b>1.43</b>	OK
		03	39.90	55.20	<b>1.38</b>	OK
		04	39.90	55.98	<b>1.40</b>	OK
		05	39.90	56.42	<b>1.41</b>	OK
		06	39.90	57.45	<b>1.44</b>	OK
		09	320.00	451.28	<b>1.41</b>	OK
		10	320.00	460.06	<b>1.44</b>	OK
	W-80; 60°	07	40.00	53.33	<b>1.33</b>	OK
		08	40.00	53.02	<b>1.33</b>	OK
	N-150; 0°	13	20.00	22.71	<b>1.14</b>	OK
		14	20.00	22.44	<b>1.12</b>	OK
	S-Cs; 0°	15	24.00	23.67	<b>0.99</b>	OK
		16	24.00	23.69	<b>0.99</b>	OK
NIR		23		0.00		
		24		0.00		
		25		0.00		
		26		0.00		
		27		0.00		
	28		0.00			

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.20	0.20	0.20	0.19	7%
Sr-90/Y-90; 0°	2	1.02	1.02	1.02	1.01	0%
Sr-90/Y-90; 60°	2	0.47	0.47	0.47	0.47	0%
Beta all	6	0.47	0.56	1.02	0.19	66%
N-20; 0°	2	1.51	1.51	1.57	1.46	5%
W-80; 0°	8	1.42	1.43	1.48	1.38	2%
W-80; 60°	2	1.33	1.33	1.33	1.33	0%
N-150; 0°	2	1.13	1.13	1.14	1.12	1%
S-Cs; 0°	2	0.99	0.99	0.99	0.99	0%
Photon all	16	1.41	1.33	1.57	0.99	13%
All	22	1.33	1.12	1.57	0.19	38%

outliers: 1 of 16

fraction of outliers: 6%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

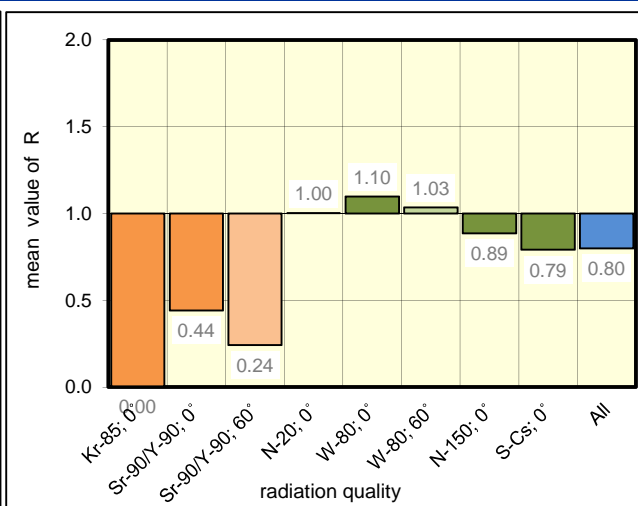
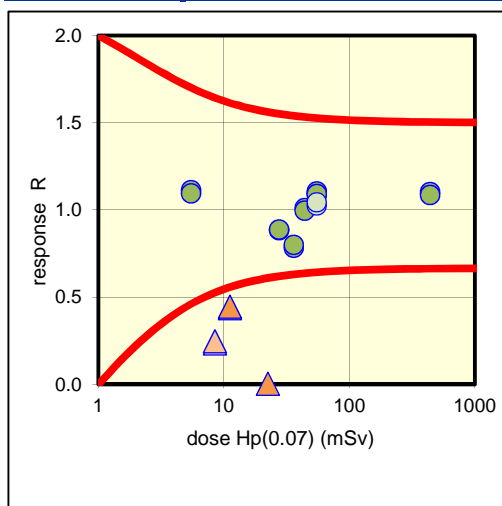
## system 46 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.50	0.1	0.00	(outlier)
		22	22.50	0.1	0.00	(outlier)
	Sr-90/Y-90; 0°	17	11.20	4.9	0.44	(outlier)
		18	11.20	5.0	0.45	(outlier)
		19	8.50	2.0	0.24	(outlier)
Sr-90/Y-90; 60°	20	8.50	2.1	0.25	(outlier)	
	Photon	N-20; 0°	11	44.00	44.5	<b>1.01</b>
12			44.00	43.8	<b>1.00</b>	OK
W-80; 0°		01	5.48	6.1	<b>1.11</b>	OK
		02	5.48	6.0	<b>1.09</b>	OK
		03	55.20	60.5	<b>1.10</b>	OK
		04	55.20	61.1	<b>1.11</b>	OK
		05	55.20	60.2	<b>1.09</b>	OK
		06	55.20	60.3	<b>1.09</b>	OK
		09	440.00	485.1	<b>1.10</b>	OK
10		440.00	478.3	<b>1.09</b>	OK	
W-80; 60°		07	55.10	56.5	<b>1.03</b>	OK
		08	55.10	57.5	<b>1.04</b>	OK
N-150; 0°		13	27.50	24.3	<b>0.88</b>	OK
	14	27.50	24.4	<b>0.89</b>	OK	
S-Cs; 0°	16	36.00	28.2	<b>0.78</b>	OK	
	28	36.00	28.8	<b>0.80</b>	OK	
	NIR	23				
	NIR	24				
	NIR	25				
	NIR	26				
	WIR	15			25.7	

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.00	0.00	0.00	0.00	0%
Sr-90/Y-90; 0°	2	0.44	0.44	0.45	0.44	1%
Sr-90/Y-90; 60°	2	0.24	0.24	0.25	0.24	3%
Beta all	6	0.24	0.23	0.45	0.00	85%
N-20; 0°	2	1.00	1.00	1.01	1.00	1%
W-80; 0°	8	1.10	1.10	1.11	1.09	1%
W-80; 60°	2	1.03	1.03	1.04	1.03	1%
N-150; 0°	2	0.89	0.89	0.89	0.88	0%
S-Cs; 0°	2	0.79	0.79	0.80	0.78	1%
Photon all	16	1.07	1.01	1.11	0.78	11%
All	22	1.00	0.80	1.11	0.00	48%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv



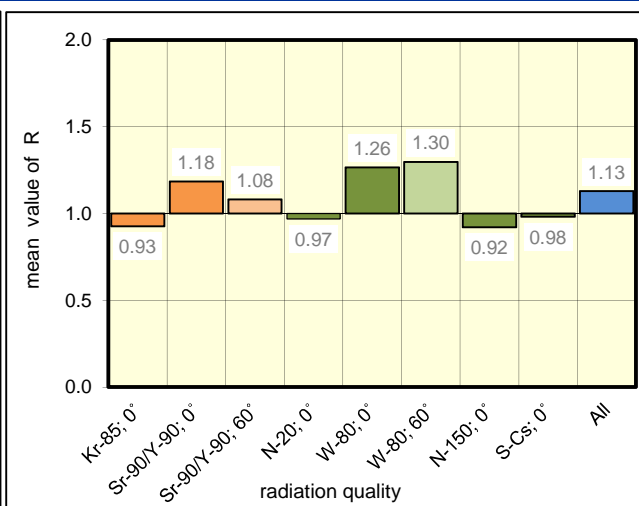
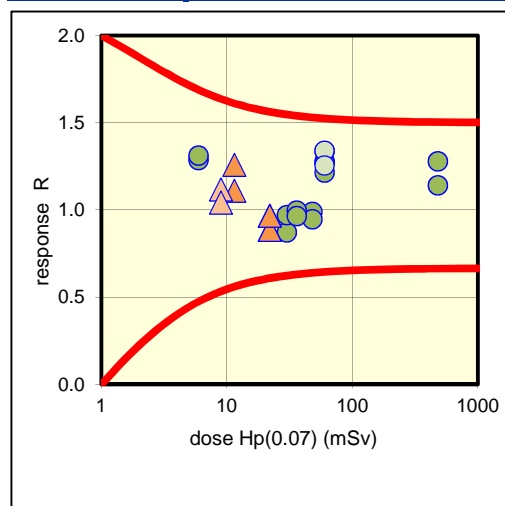
## system 47 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.00	19.48	<b>0.89</b>	OK
		22	22.00	21.28	<b>0.97</b>	OK
	Sr-90/Y-90; 0°	17	11.50	14.48	<b>1.26</b>	OK
		18	11.50	12.76	<b>1.11</b>	OK
		19	9.00	10.06	<b>1.12</b>	OK
Sr-90/Y-90; 60°	20	9.00	9.38	<b>1.04</b>	OK	
Photon	N-20; 0°	11	48.00	47.48	<b>0.99</b>	OK
		12	48.00	45.43	<b>0.95</b>	OK
	W-80; 0°	01	5.96	7.67	<b>1.29</b>	OK
		02	5.96	7.82	<b>1.31</b>	OK
		03	60.20	80.52	<b>1.34</b>	OK
		04	60.20	76.85	<b>1.28</b>	OK
		05	60.20	73.06	<b>1.21</b>	OK
		06	60.20	76.45	<b>1.27</b>	OK
		09	480.00	547.75	<b>1.14</b>	OK
	10	480.00	613.36	<b>1.28</b>	OK	
	W-80; 60°	07	60.20	80.57	<b>1.34</b>	OK
		08	60.20	75.56	<b>1.26</b>	OK
	N-150; 0°	13	30.10	26.22	<b>0.87</b>	OK
		14	30.10	29.21	<b>0.97</b>	OK
S-Cs; 0°	15	36.00	35.88	<b>1.00</b>	OK	
	16	36.00	34.77	<b>0.97</b>	OK	
	NIR	23		0.29		
	NIR	24		0.31		
	NIR	25		0.31		
	NIR	26		0.26		
	NIR	27		0.35		
	NIR	28		0.30		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.93	0.93	0.97	0.89	6%
Sr-90/Y-90; 0°	2	1.18	1.18	1.26	1.11	9%
Sr-90/Y-90; 60°	2	1.08	1.08	1.12	1.04	5%
Beta all	<b>6</b>	<b>1.08</b>	<b>1.06</b>	<b>1.26</b>	<b>0.89</b>	<b>12%</b>
N-20; 0°	2	0.97	0.97	0.99	0.95	3%
W-80; 0°	8	1.28	1.26	1.34	1.14	5%
W-80; 60°	2	1.30	1.30	1.34	1.26	5%
N-150; 0°	2	0.92	0.92	0.97	0.87	8%
S-Cs; 0°	2	0.98	0.98	1.00	0.97	2%
Photon all	<b>16</b>	<b>1.23</b>	<b>1.15</b>	<b>1.34</b>	<b>0.87</b>	<b>14%</b>
All	<b>22</b>	<b>1.13</b>	<b>1.13</b>	<b>1.34</b>	<b>0.87</b>	<b>14%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

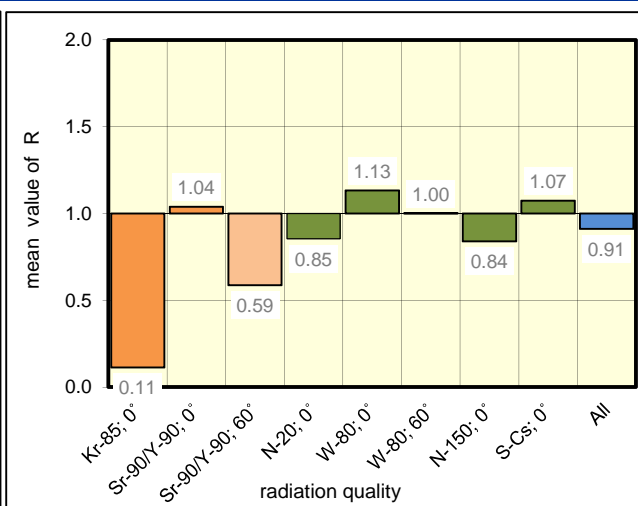
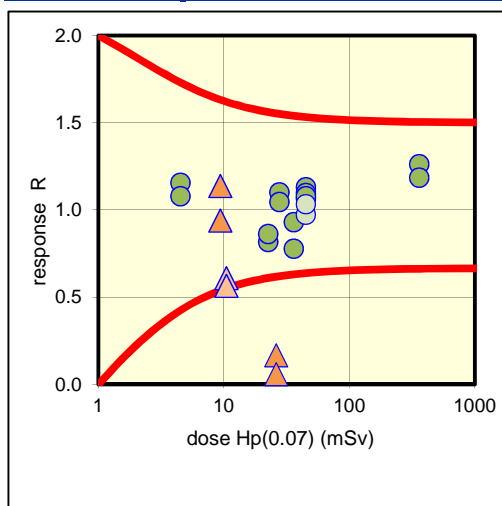
## system 48 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.20	4.375	0.17	(outlier)
		22	26.20	1.526	0.06	(outlier)
	Sr-90/Y-90; 0°	17	9.40	10.69	1.14	(OK)
		18	9.40	8.825	0.94	(OK)
		19	10.50	6.397	0.61	(OK)
Sr-90/Y-90; 60°	20	10.50	5.928	0.56	(OK)	
	N-20; 0°	13	36.00	28.01	<b>0.78</b>	OK
Photon		W-80; 0°	14	36.00	33.49	<b>0.93</b>
	01		4.50	5.203	<b>1.16</b>	OK
	02		4.50	4.851	<b>1.08</b>	OK
	03		45.00	50.87	<b>1.13</b>	OK
	04		45.00	49.38	<b>1.10</b>	OK
	05		45.00	47.96	<b>1.07</b>	OK
	06		45.00	48.57	<b>1.08</b>	OK
	09		360.00	454.5	<b>1.26</b>	OK
	10		360.00	426.4	<b>1.18</b>	OK
	W-80; 60°		07	45.00	43.74	<b>0.97</b>
08		45.00	46.48	<b>1.03</b>	OK	
N-150; 0°	11	22.50	18.38	<b>0.82</b>	OK	
	12	22.50	19.39	<b>0.86</b>	OK	
S-Cs; 0°	15	27.70	30.48	<b>1.10</b>	OK	
	16	27.70	28.97	<b>1.05</b>	OK	
NIR	NIR	23		0.000		
		24		0.000		
		25		0.000		
		26		0.000		
		27		0.000		
		28		0.000		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.11	0.11	0.17	0.06	68%
Sr-90/Y-90; 0°	2	1.04	1.04	1.14	0.94	14%
Sr-90/Y-90; 60°	2	0.59	0.59	0.61	0.56	5%
Beta all	6	0.59	0.58	1.14	0.06	73%
N-20; 0°	2	0.85	0.85	0.93	0.78	13%
W-80; 0°	8	1.11	1.13	1.26	1.07	6%
W-80; 60°	2	1.00	1.00	1.03	0.97	4%
N-150; 0°	2	0.84	0.84	0.86	0.82	4%
S-Cs; 0°	2	1.07	1.07	1.10	1.05	4%
Photon all	16	1.07	1.04	1.26	0.78	13%
All	22	1.04	0.91	1.26	0.06	34%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

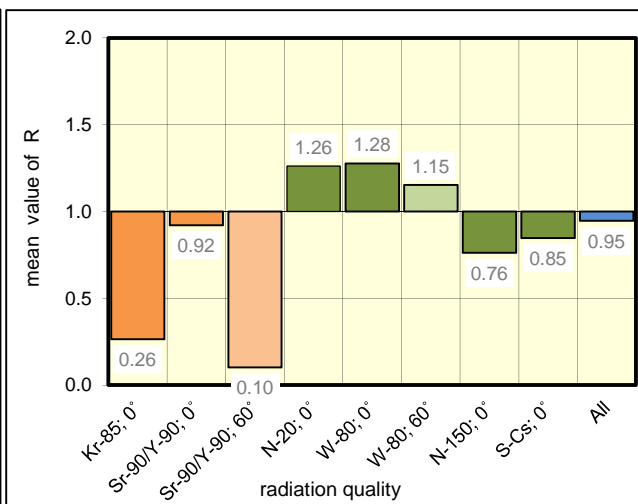
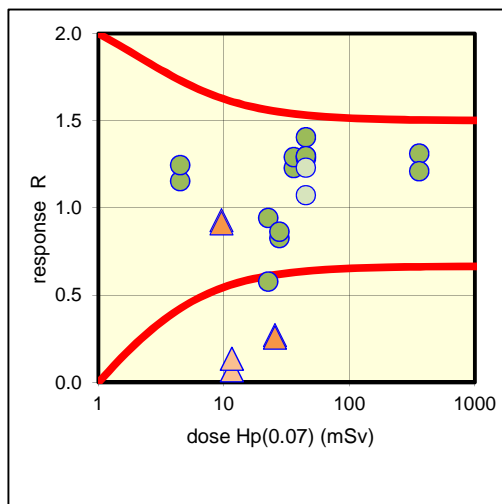
## system 49 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	25.60	6.95	<b>0.27</b>	outlier
		22	25.60	6.57	<b>0.26</b>	outlier
	Sr-90/Y-90; 0°	17	9.60	8.93	<b>0.93</b>	OK
		18	9.60	8.76	<b>0.91</b>	OK
	Sr-90/Y-90; 60°	19	11.60	0.81	<b>0.07</b>	outlier
20		11.60	1.57	<b>0.14</b>	outlier	
Photon	N-20; 0°	13	36.00	44.28	<b>1.23</b>	OK
		14	36.00	46.50	<b>1.29</b>	OK
	W-80; 0°	01	4.49	5.18	<b>1.15</b>	OK
		02	4.49	5.59	<b>1.24</b>	OK
		03	45.00	58.30	<b>1.30</b>	OK
		04	45.00	63.22	<b>1.40</b>	OK
		05	45.00	57.79	<b>1.28</b>	OK
		06	45.00	58.40	<b>1.30</b>	OK
		09	360.00	472.21	<b>1.31</b>	OK
	10	360.00	436.19	<b>1.21</b>	OK	
	W-80; 60°	07	45.00	48.30	<b>1.07</b>	OK
		08	45.00	55.39	<b>1.23</b>	OK
	N-150; 0°	11	22.50	13.03	<b>0.58</b>	outlier
		12	22.50	21.24	<b>0.94</b>	OK
S-Cs; 0°	15	27.70	22.95	<b>0.83</b>	OK	
	16	27.70	23.94	<b>0.86</b>	OK	
NIR	NIR	23		0.03		
	NIR	24		0.02		
	NIR	25		0.04		
	NIR	26		0.01		
	NIR	27		-0.07		
	NIR	28		-0.04		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.26	0.26	0.27	0.26	4%
Sr-90/Y-90; 0°	2	0.92	0.92	0.93	0.91	1%
Sr-90/Y-90; 60°	2	0.10	0.10	0.14	0.07	45%
<b>Beta all</b>	<b>6</b>	<b>0.26</b>	<b>0.43</b>	<b>0.93</b>	<b>0.07</b>	<b>90%</b>
N-20; 0°	2	1.26	1.26	1.29	1.23	3%
W-80; 0°	8	1.29	1.28	1.40	1.15	6%
W-80; 60°	2	1.15	1.15	1.23	1.07	10%
N-150; 0°	2	0.76	0.76	0.94	0.58	34%
S-Cs; 0°	2	0.85	0.85	0.86	0.83	3%
<b>Photon all</b>	<b>16</b>	<b>1.23</b>	<b>1.14</b>	<b>1.40</b>	<b>0.58</b>	<b>20%</b>
<b>All</b>	<b>22</b>	<b>1.11</b>	<b>0.95</b>	<b>1.40</b>	<b>0.07</b>	<b>44%</b>

outliers: 5 of 22

fraction of outliers: 23%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

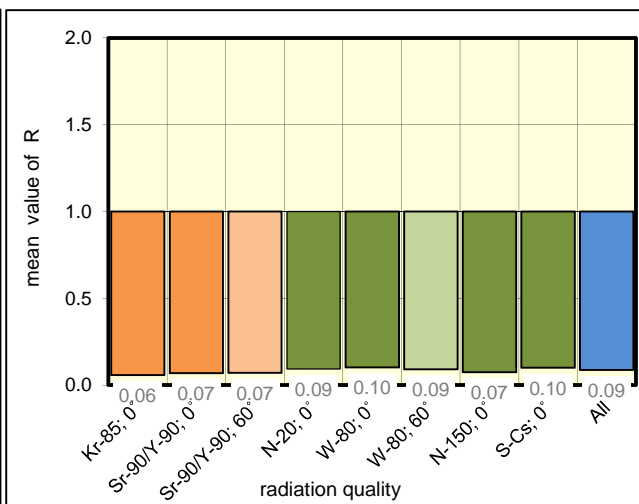
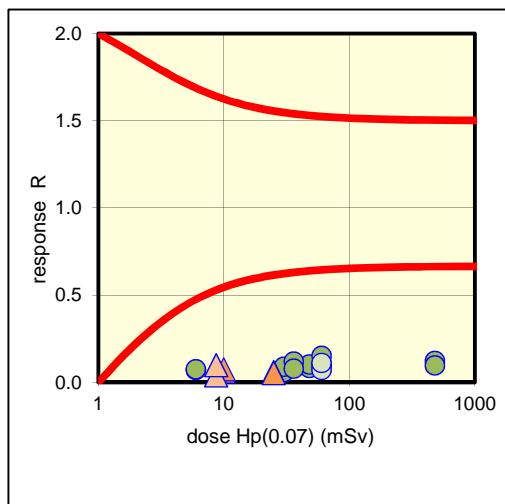
## system 50 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	25.00	1.50	<b>0.06</b>	outlier
		22	25.00	1.35	<b>0.05</b>	outlier
	Sr-90/Y-90; 0°	23	10.00	0.63	<b>0.06</b>	outlier
		24	10.00	0.75	<b>0.08</b>	outlier
	Sr-90/Y-90; 60°	19	8.70	0.35	<b>0.04</b>	outlier
20		8.70	0.86	<b>0.10</b>	outlier	
Photon	N-20; 0°	11	48.00	3.99	<b>0.08</b>	outlier
		12	48.00	4.92	<b>0.10</b>	outlier
	W-80; 0°	01	5.97	0.43	<b>0.07</b>	outlier
		02	5.97	0.45	<b>0.08</b>	outlier
		03	60.30	4.63	<b>0.08</b>	outlier
		04	60.30	6.33	<b>0.10</b>	outlier
		05	60.30	9.24	<b>0.15</b>	outlier
		06	60.30	6.48	<b>0.11</b>	outlier
		09	480.00	59.67	<b>0.12</b>	outlier
	10	480.00	46.66	<b>0.10</b>	outlier	
	W-80; 60°	07	60.10	4.27	<b>0.07</b>	outlier
		08	60.10	6.70	<b>0.11</b>	outlier
	N-150; 0°	13	30.00	1.78	<b>0.06</b>	outlier
		14	30.00	2.71	<b>0.09</b>	outlier
	S-Cs; 0°	15	36.00	4.32	<b>0.12</b>	outlier
16		36.00	2.88	<b>0.08</b>	outlier	
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
	NIR	28		0.00		
	WIR	17		0.90		
WIR	18		0.65			

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.06	0.06	0.06	0.05	7%
Sr-90/Y-90; 0°	2	0.07	0.07	0.08	0.06	12%
Sr-90/Y-90; 60°	2	0.07	0.07	0.10	0.04	60%
Beta all	<b>6</b>	<b>0.06</b>	<b>0.07</b>	<b>0.10</b>	<b>0.04</b>	<b>31%</b>
N-20; 0°	2	0.09	0.09	0.10	0.08	15%
W-80; 0°	8	0.10	0.10	0.15	0.07	27%
W-80; 60°	2	0.09	0.09	0.11	0.07	31%
N-150; 0°	2	0.07	0.07	0.09	0.06	29%
S-Cs; 0°	2	0.10	0.10	0.12	0.08	28%
Photon all	<b>16</b>	<b>0.09</b>	<b>0.10</b>	<b>0.15</b>	<b>0.06</b>	<b>26%</b>
All	<b>22</b>	<b>0.08</b>	<b>0.09</b>	<b>0.15</b>	<b>0.04</b>	<b>31%</b>

outliers: 22 of 22

fraction of outliers: 100%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

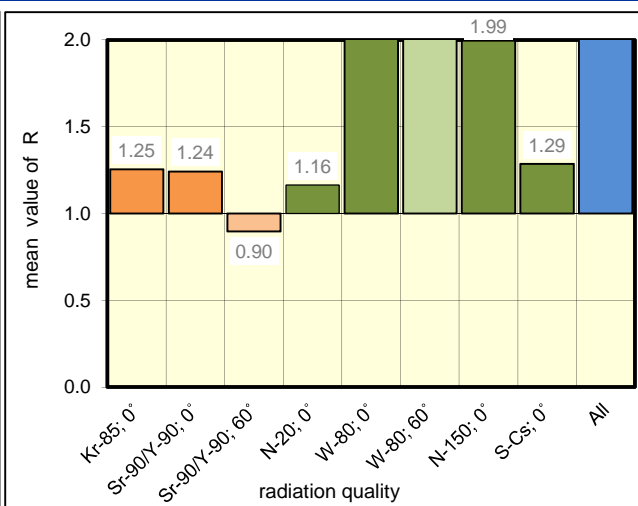
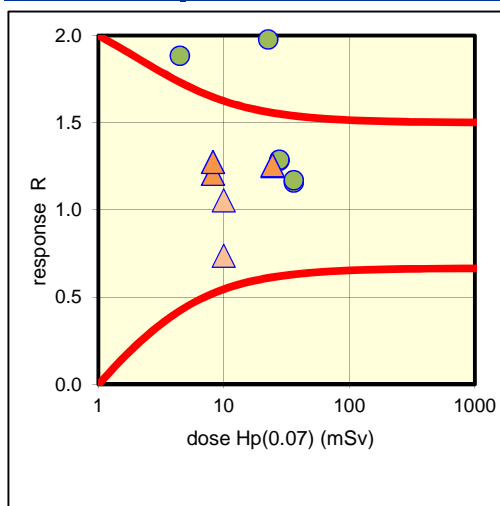
## system 51 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	24.50	30.63	<b>1.25</b>	OK
		22	24.50	30.79	<b>1.26</b>	OK
	Sr-90/Y-90; 0°	17	8.20	9.90	<b>1.21</b>	OK
		18	8.20	10.46	<b>1.28</b>	OK
		19	10.00	7.38	<b>0.74</b>	OK
Sr-90/Y-90; 60°	20	10.00	10.55	<b>1.06</b>	OK	
	20	10.00	10.55	<b>1.06</b>	OK	
Photon	N-20; 0°	13	36.00	41.65	<b>1.16</b>	OK
		14	36.00	42.12	<b>1.17</b>	OK
	W-80; 0°	01	4.47	8.42	<b>1.88</b>	outlier
		02	4.47	9.17	<b>2.05</b>	outlier
		03	45.00	165.98	<b>3.69</b>	outlier
		04	45.00	137.24	<b>3.05</b>	outlier
		05	45.00	152.78	<b>3.40</b>	outlier
		06	45.00	149.49	<b>3.32</b>	outlier
		09	360.00	1350	<b>3.75</b>	outlier
		10	360.00	1375	<b>3.82</b>	outlier
	W-80; 60°	07	45.00	135.28	<b>3.01</b>	outlier
		08	45.00	141.35	<b>3.14</b>	outlier
	N-150; 0°	11	22.50	45.29	<b>2.01</b>	outlier
		12	22.50	44.47	<b>1.98</b>	outlier
	S-Cs; 0°	15	27.70	35.54	<b>1.28</b>	OK
16		27.70	35.65	<b>1.29</b>	OK	
NIR	NIR	23		<0.01		
	NIR	24		<0.01		
	NIR	25		<0.01		
	NIR	26		<0.01		
	NIR	27		<0.01		
	NIR	28		<0.01		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	1.25	1.25	1.26	1.25	0%
Sr-90/Y-90; 0°	2	1.24	1.24	1.28	1.21	4%
Sr-90/Y-90; 60°	2	0.90	0.90	1.06	0.74	25%
<b>Beta all</b>	<b>6</b>	<b>1.23</b>	<b>1.13</b>	<b>1.28</b>	<b>0.74</b>	<b>18%</b>
N-20; 0°	2	1.16	1.16	1.17	1.16	1%
W-80; 0°	8	3.36	3.12	3.82	1.88	24%
W-80; 60°	2	3.07	3.07	3.14	3.01	3%
N-150; 0°	2	1.99	1.99	2.01	1.98	1%
S-Cs; 0°	2	1.29	1.29	1.29	1.28	0%
<b>Photon all</b>	<b>16</b>	<b>2.53</b>	<b>2.50</b>	<b>3.82</b>	<b>1.16</b>	<b>40%</b>
<b>All</b>	<b>22</b>	<b>1.93</b>	<b>2.13</b>	<b>3.82</b>	<b>0.74</b>	<b>49%</b>

outliers: 12 of 22

fraction of outliers: 55%



Results: IC2009 10 values out of diagramme range (>2)!

trumpet parameter: 1.5 / 1.0 mSv

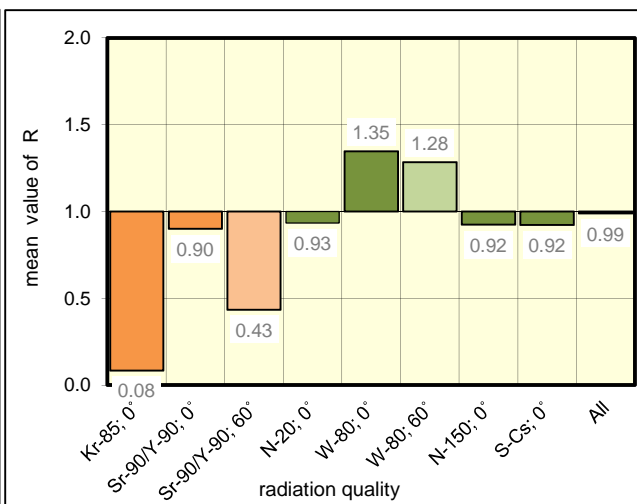
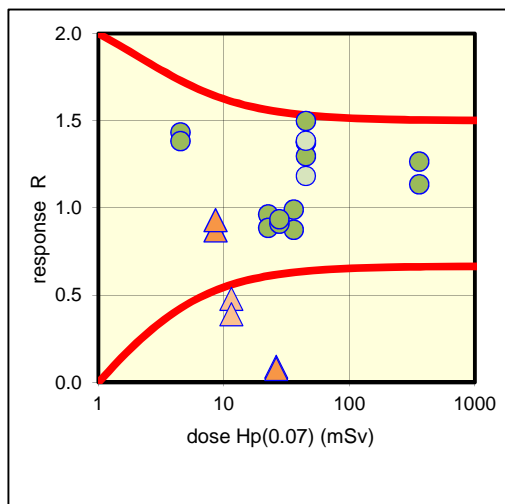
## system 52 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	26.20	2.37	<b>0.09</b>	outlier
		22	26.20	2.03	<b>0.08</b>	outlier
	Sr-90/Y-90; 0°	17	8.60	7.49	<b>0.87</b>	OK
		18	8.60	8.00	<b>0.93</b>	OK
		19	11.50	5.50	<b>0.48</b>	outlier
Sr-90/Y-90; 60°	20	11.50	4.49	<b>0.39</b>	outlier	
Photon	N-20; 0°	13	36.00	35.70	<b>0.99</b>	OK
		14	36.00	31.50	<b>0.88</b>	OK
	W-80; 0°	01	4.51	6.46	<b>1.43</b>	OK
		02	4.51	6.24	<b>1.38</b>	OK
		03	45.00	67.46	<b>1.50</b>	OK
		04	45.00	61.95	<b>1.38</b>	OK
		05	45.00	62.00	<b>1.38</b>	OK
		06	45.00	58.34	<b>1.30</b>	OK
		09	360.00	455.55	<b>1.27</b>	OK
		10	360.00	409.16	<b>1.14</b>	OK
	W-80; 60°	07	45.00	53.25	<b>1.18</b>	OK
		08	45.00	62.30	<b>1.38</b>	OK
	N-150; 0°	11	22.50	21.66	<b>0.96</b>	OK
		12	22.50	19.93	<b>0.89</b>	OK
	S-Cs; 0°	15	27.70	25.23	<b>0.91</b>	OK
16		27.70	25.91	<b>0.94</b>	OK	
NIR	NIR	23		0		
	NIR	24		0		
	NIR	25		0		
	NIR	26		0		
	NIR	27		0		
	NIR	28		0		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.08	0.08	0.09	0.08	11%
Sr-90/Y-90; 0°	2	0.90	0.90	0.93	0.87	5%
Sr-90/Y-90; 60°	2	0.43	0.43	0.48	0.39	14%
Beta all	<b>6</b>	<b>0.43</b>	<b>0.47</b>	<b>0.93</b>	<b>0.08</b>	<b>78%</b>
N-20; 0°	2	0.93	0.93	0.99	0.88	9%
W-80; 0°	8	1.38	1.35	1.50	1.14	8%
W-80; 60°	2	1.28	1.28	1.38	1.18	11%
N-150; 0°	2	0.92	0.92	0.96	0.89	6%
S-Cs; 0°	2	0.92	0.92	0.94	0.91	2%
Photon all	<b>16</b>	<b>1.22</b>	<b>1.18</b>	<b>1.50</b>	<b>0.88</b>	<b>19%</b>
All	<b>22</b>	<b>0.98</b>	<b>0.99</b>	<b>1.50</b>	<b>0.08</b>	<b>42%</b>

outliers: 4 of 22

fraction of outliers: 18%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

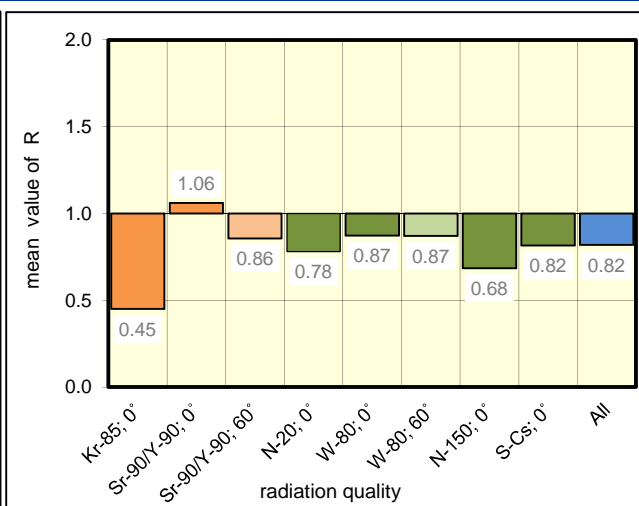
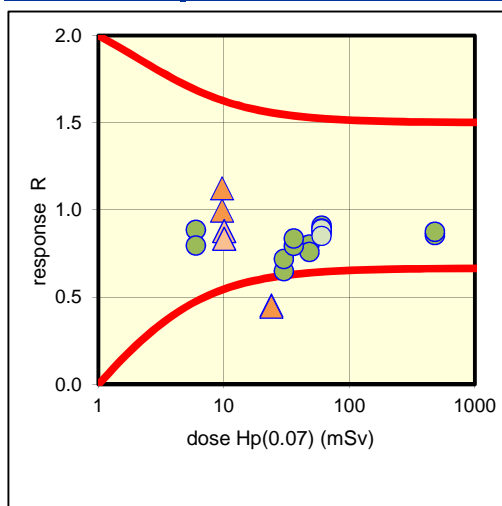
## system 53 : beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	24.00	10.89	<b>0.45</b>	outlier outlier
		22	24.00	10.68	<b>0.45</b>	
	Sr-90/Y-90; 0°	17	9.70	9.670	<b>1.00</b>	OK
		18	9.70	10.90	<b>1.12</b>	OK
		19	10.10	8.869	<b>0.88</b>	OK
Sr-90/Y-90; 60°	20	10.10	8.427	<b>0.83</b>	OK	
Photon	N-20; 0°	11	48.00	38.50	0.80	(OK)
		12	48.00	36.44	0.76	(OK)
	W-80; 0°	01	5.97	5.294	0.89	(OK)
		02	5.97	4.760	0.80	(OK)
		03	60.20	54.83	0.91	(OK)
		04	60.20	53.75	0.89	(OK)
		05	60.20	53.43	0.89	(OK)
		06	60.20	52.31	0.87	(OK)
		09	480.00	411.4	0.86	(OK)
	10	480.00	419.9	0.87	(OK)	
	W-80; 60°	07	60.10	53.43	0.89	(OK)
		08	60.10	51.21	0.85	(OK)
	N-150; 0°	13	30.00	19.48	0.65	(OK)
		14	30.00	21.57	0.72	(OK)
S-Cs; 0°	15	36.00	28.63	0.80	(OK)	
	16	36.00	30.11	0.84	(OK)	
	NIR	23		0.000		
	NIR	24		0.000		
	NIR	25		0.000		
	NIR	26		0.000		
	NIR	27		0.000		
	NIR	28		0.000		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.45	0.45	0.45	0.45	1%
Sr-90/Y-90; 0°	2	1.06	1.06	1.12	1.00	8%
Sr-90/Y-90; 60°	2	0.86	0.86	0.88	0.83	4%
<b>Beta all</b>	<b>6</b>	<b>0.86</b>	<b>0.79</b>	<b>1.12</b>	<b>0.45</b>	<b>36%</b>
N-20; 0°	2	0.78	0.78	0.80	0.76	4%
W-80; 0°	8	0.88	0.87	0.91	0.80	4%
W-80; 60°	2	0.87	0.87	0.89	0.85	3%
N-150; 0°	2	0.68	0.68	0.72	0.65	7%
S-Cs; 0°	2	0.82	0.82	0.84	0.80	4%
<b>Photon all</b>	<b>16</b>	<b>0.85</b>	<b>0.83</b>	<b>0.91</b>	<b>0.65</b>	<b>9%</b>
<b>All</b>	<b>22</b>	<b>0.85</b>	<b>0.82</b>	<b>1.12</b>	<b>0.45</b>	<b>19%</b>

outliers: 2 of 6

fraction of outliers: 33%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

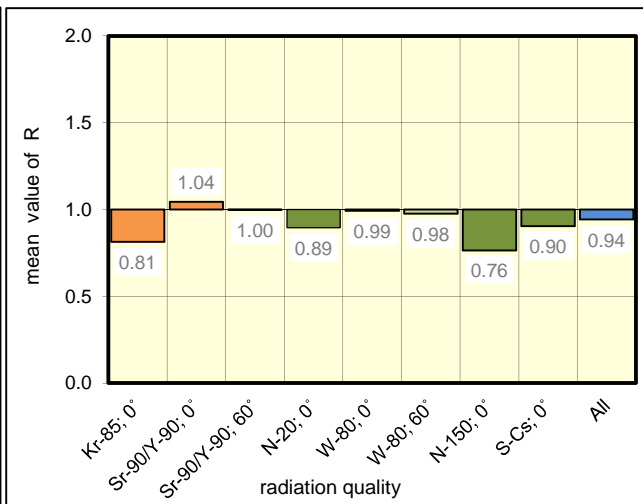
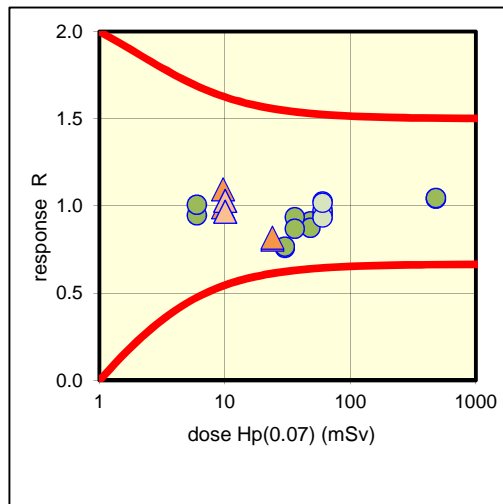
## system 54 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	24.00	19.38	<b>0.81</b>	OK
		22	24.00	19.64	<b>0.82</b>	OK
	Sr-90/Y-90; 0°	17	9.70	9.63	<b>0.99</b>	OK
		18	9.70	10.63	<b>1.10</b>	OK
		19	10.10	10.39	<b>1.03</b>	OK
Sr-90/Y-90; 60°	20	10.10	9.76	<b>0.97</b>	OK	
Photon	N-20; 0°	11	48.00	43.81	<b>0.91</b>	OK
		12	48.00	42.04	<b>0.88</b>	OK
	W-80; 0°	01	5.97	5.65	<b>0.95</b>	OK
		02	5.97	6.01	<b>1.01</b>	OK
		03	60.20	57.90	<b>0.96</b>	OK
		04	60.20	56.47	<b>0.94</b>	OK
		05	60.20	61.72	<b>1.03</b>	OK
		06	60.20	58.76	<b>0.98</b>	OK
		09	480.00	499.99	<b>1.04</b>	OK
	10	480.00	502.39	<b>1.05</b>	OK	
	W-80; 60°	07	60.10	56.13	<b>0.93</b>	OK
		08	60.10	61.17	<b>1.02</b>	OK
	N-150; 0°	13	30.00	22.78	<b>0.76</b>	OK
		14	30.00	23.02	<b>0.77</b>	OK
	S-Cs; 0°	15	36.00	33.69	<b>0.94</b>	OK
16		36.00	31.33	<b>0.87</b>	OK	
NIR	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
	NIR	28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.81	0.81	0.82	0.81	1%
Sr-90/Y-90; 0°	2	1.04	1.04	1.10	0.99	7%
Sr-90/Y-90; 60°	2	1.00	1.00	1.03	0.97	4%
Beta all	<b>6</b>	<b>0.98</b>	<b>0.95</b>	<b>1.10</b>	<b>0.81</b>	<b>12%</b>
N-20; 0°	2	0.89	0.89	0.91	0.88	3%
W-80; 0°	8	0.99	0.99	1.05	0.94	4%
W-80; 60°	2	0.98	0.98	1.02	0.93	6%
N-150; 0°	2	0.76	0.76	0.77	0.76	1%
S-Cs; 0°	2	0.90	0.90	0.94	0.87	5%
Photon all	<b>16</b>	<b>0.94</b>	<b>0.94</b>	<b>1.05</b>	<b>0.76</b>	<b>9%</b>
All	<b>22</b>	<b>0.95</b>	<b>0.94</b>	<b>1.10</b>	<b>0.76</b>	<b>10%</b>

outliers: 0 of 22

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv



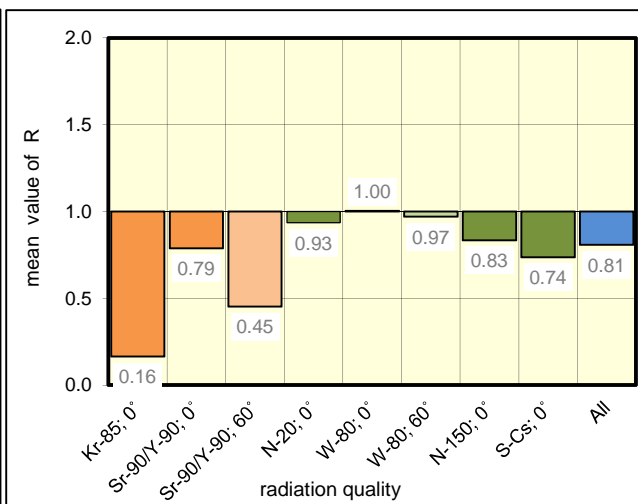
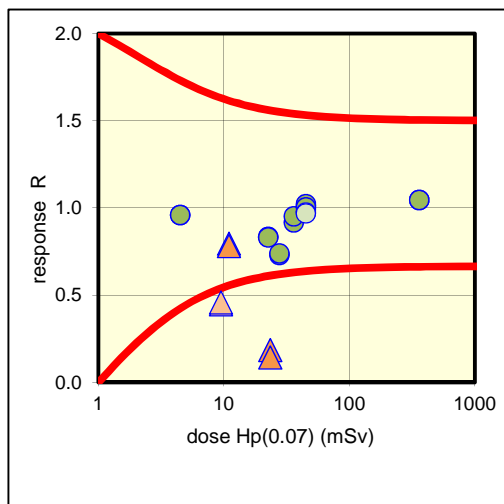
## system 55 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	23.50	4.36	<b>0.19</b>	outlier
		22	23.50	3.35	<b>0.14</b>	outlier
	Sr-90/Y-90; 0°	17	11.00	8.75	<b>0.80</b>	OK
		18	11.00	8.60	<b>0.78</b>	OK
	Sr-90/Y-90; 60°	19	9.50	4.25	<b>0.45</b>	outlier
20		9.50	4.35	<b>0.46</b>	outlier	
Photon	N-20; 0°	13	36.00	33.00	<b>0.92</b>	OK
		14	36.00	34.30	<b>0.95</b>	OK
	W-80; 0°	01	4.48	4.30	<b>0.96</b>	OK
		02	4.48	4.30	<b>0.96</b>	OK
		03	45.00	45.40	<b>1.01</b>	OK
		04	45.00	45.95	<b>1.02</b>	OK
		05	45.00	44.05	<b>0.98</b>	OK
		06	45.00	45.15	<b>1.00</b>	OK
		09	360.00	376.20	<b>1.05</b>	OK
	10	360.00	376.75	<b>1.05</b>	OK	
	W-80; 60°	07	45.00	43.80	<b>0.97</b>	OK
		08	45.00	43.55	<b>0.97</b>	OK
	N-150; 0°	11	22.50	18.80	<b>0.84</b>	OK
		12	22.50	18.70	<b>0.83</b>	OK
S-Cs; 0°	15	27.70	20.25	<b>0.73</b>	OK	
	16	27.70	20.50	<b>0.74</b>	OK	
NIR	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
	NIR	28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.16	0.16	0.19	0.14	19%
Sr-90/Y-90; 0°	2	0.79	0.79	0.80	0.78	1%
Sr-90/Y-90; 60°	2	0.45	0.45	0.46	0.45	2%
<b>Beta all</b>	<b>6</b>	<b>0.45</b>	<b>0.47</b>	<b>0.80</b>	<b>0.14</b>	<b>60%</b>
N-20; 0°	2	0.93	0.93	0.95	0.92	3%
W-80; 0°	8	1.01	1.00	1.05	0.96	3%
W-80; 60°	2	0.97	0.97	0.97	0.97	0%
N-150; 0°	2	0.83	0.83	0.84	0.83	0%
S-Cs; 0°	2	0.74	0.74	0.74	0.73	1%
<b>Photon all</b>	<b>16</b>	<b>0.96</b>	<b>0.94</b>	<b>1.05</b>	<b>0.73</b>	<b>11%</b>
<b>All</b>	<b>22</b>	<b>0.93</b>	<b>0.81</b>	<b>1.05</b>	<b>0.14</b>	<b>33%</b>

outliers: 4 of 22

fraction of outliers: 18%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

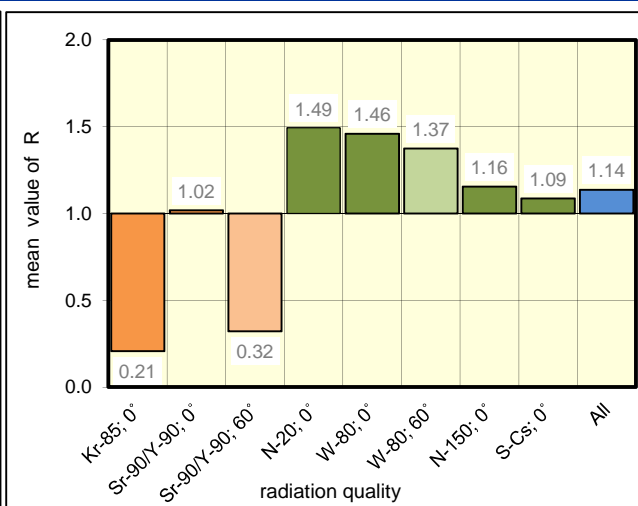
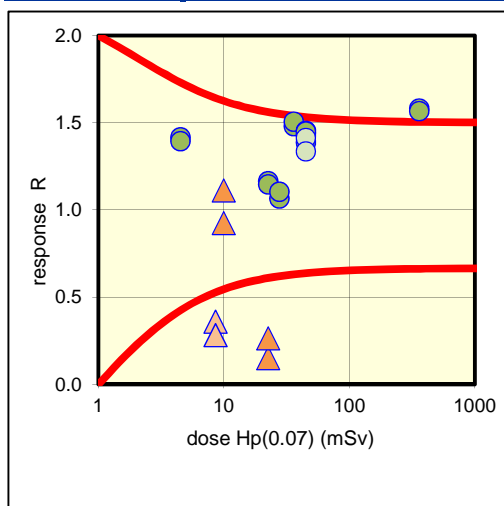
## system 56 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	22.60	3.41	0.15	(outlier)
		22	22.60	5.98	0.26	(outlier)
	Sr-90/Y-90; 0°	17	10.00	11.11	1.11	(OK)
		18	10.00	9.24	0.92	(OK)
	Sr-90/Y-90; 60°	19	8.60	3.1	0.36	(outlier)
20		8.60	2.43	0.28	(outlier)	
Photon	N-20; 0°	13	36.00	53.32	<b>1.48</b>	OK
		14	36.00	54.2	<b>1.51</b>	OK
	W-80; 0°	01	4.52	6.4	<b>1.42</b>	OK
		02	4.52	6.3	<b>1.39</b>	OK
		03	45.00	64.41	<b>1.43</b>	OK
		04	45.00	62.41	<b>1.39</b>	OK
		05	45.00	65.34	<b>1.45</b>	OK
		06	45.00	65.25	<b>1.45</b>	OK
		09	360.00	569.0	<b>1.58</b>	outlier
	10	360.00	564.1	<b>1.57</b>	outlier	
	W-80; 60°	07	45.00	63.53	<b>1.41</b>	OK
		08	45.00	60.06	<b>1.33</b>	OK
	N-150; 0°	11	22.50	26.21	<b>1.16</b>	OK
		12	22.50	25.79	<b>1.15</b>	OK
S-Cs; 0°	15	27.70	29.55	<b>1.07</b>	OK	
	16	27.70	30.61	<b>1.11</b>	OK	
NIR	NIR	23		0.00		
	NIR	24		0.00		
	NIR	25		0.00		
	NIR	26		0.00		
	NIR	27		0.00		
	NIR	28		0.00		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.21	0.21	0.26	0.15	39%
Sr-90/Y-90; 0°	2	1.02	1.02	1.11	0.92	13%
Sr-90/Y-90; 60°	2	0.32	0.32	0.36	0.28	17%
Beta all	6	0.32	0.52	1.11	0.15	77%
N-20; 0°	2	1.49	1.49	1.51	1.48	1%
W-80; 0°	8	1.44	1.46	1.58	1.39	5%
W-80; 60°	2	1.37	1.37	1.41	1.33	4%
N-150; 0°	2	1.16	1.16	1.16	1.15	1%
S-Cs; 0°	2	1.09	1.09	1.11	1.07	2%
Photon all	16	1.41	1.37	1.58	1.07	12%
All	22	1.36	1.14	1.58	0.15	40%

outliers: 2 of 16

fraction of outliers: 13%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

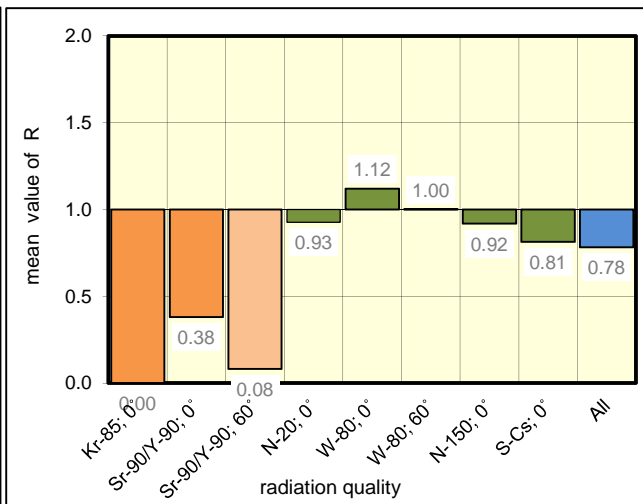
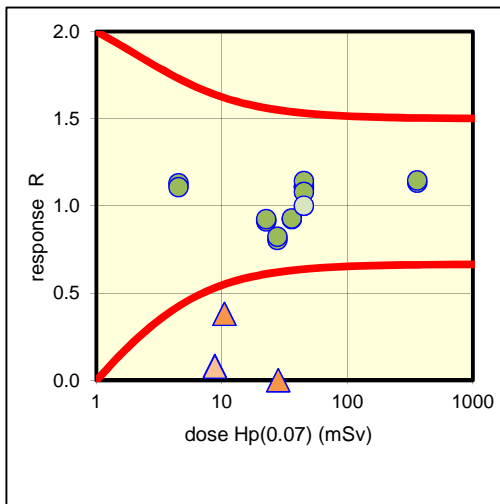
## system 57 : photon dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	28.20	0.0	0.00	(outlier)
		22	28.20	0.04	0.00	(outlier)
	Sr-90/Y-90; 0°	17	10.50	4.0	0.38	(outlier)
		18	10.50	4.0	0.38	(outlier)
		19	8.80	0.75	0.09	(outlier)
Sr-90/Y-90; 60°	20	8.80	0.7	0.08	(outlier)	
	Photon	N-20; 0°	13	36.10	33.4	<b>0.93</b>
14			36.10	33.5	<b>0.93</b>	OK
W-80; 0°		03	45.00	49.7	<b>1.10</b>	OK
		04	45.00	50.1	<b>1.11</b>	OK
		05	45.00	51.4	<b>1.14</b>	OK
		06	45.00	48.6	<b>1.08</b>	OK
		09	360.00	408.0	<b>1.13</b>	OK
		10	360.00	412.6	<b>1.15</b>	OK
W-80; 60°		27	4.51	5.1	<b>1.13</b>	OK
		28	4.51	5.0	<b>1.11</b>	OK
N-150; 0°		07	45.00	45.0	<b>1.00</b>	OK
		08	45.00	45.1	<b>1.00</b>	OK
S-Cs; 0°		11	22.50	20.5	<b>0.91</b>	OK
	12	22.50	20.8	<b>0.92</b>	OK	
S-Cs; 0°	15	27.70	22.3	<b>0.81</b>	OK	
	16	27.70	22.8	<b>0.82</b>	OK	
NIR	WIR	23				
		24				
		25				
		26				
		01		208.1		
		02		208.1		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.00	0.00	0.00	0.00	141%
Sr-90/Y-90; 0°	2	0.38	0.38	0.38	0.38	0%
Sr-90/Y-90; 60°	2	0.08	0.08	0.09	0.08	5%
Beta all	6	0.08	0.15	0.38	0.00	116%
N-20; 0°	2	0.93	0.93	0.93	0.93	0%
W-80; 0°	8	1.12	1.12	1.15	1.08	2%
W-80; 60°	2	1.00	1.00	1.00	1.00	0%
N-150; 0°	2	0.92	0.92	0.92	0.91	1%
S-Cs; 0°	2	0.81	0.81	0.82	0.81	2%
Photon all	16	1.04	1.02	1.15	0.81	12%
All	22	0.93	0.78	1.15	0.00	53%

outliers: 0 of 16

fraction of outliers: 0%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

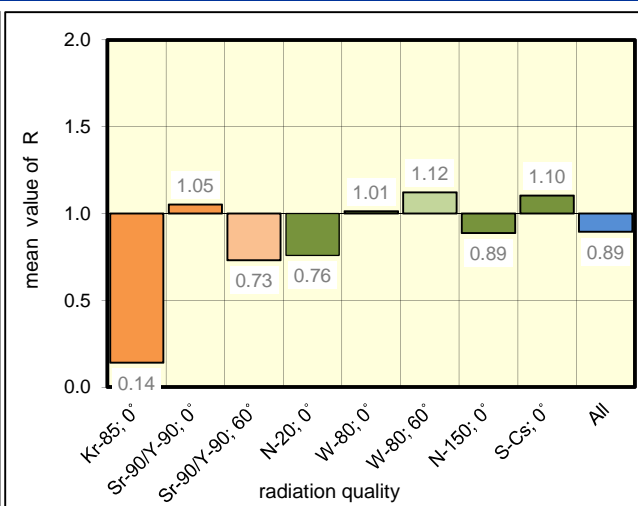
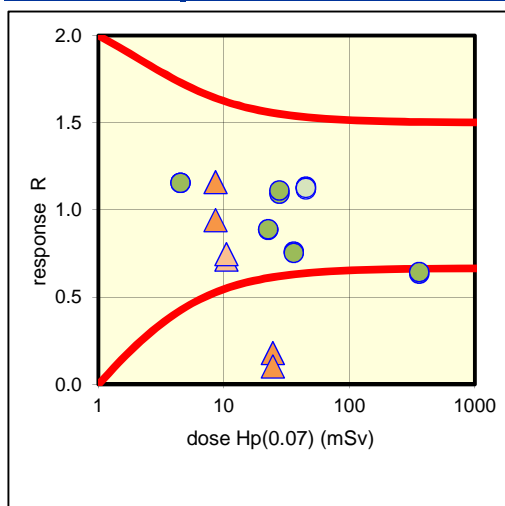
## system 58 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	24.60	4.409	<b>0.18</b>	outlier
		22	24.60	2.549	<b>0.10</b>	outlier
	Sr-90/Y-90; 0°	17	8.60	8.101	<b>0.94</b>	OK
		23	8.60	9.970	<b>1.16</b>	OK
		19	10.50	7.512	<b>0.72</b>	OK
Sr-90/Y-90; 60°	20	10.50	7.843	<b>0.75</b>	OK	
	N-20; 0°	13	36.00	27.420	<b>0.76</b>	OK
14		36.00	27.145	<b>0.75</b>	OK	
Photon	W-80; 0°	01	4.51	5.210	<b>1.16</b>	OK
		02	4.51	5.209	<b>1.15</b>	OK
		03	45.00	50.762	<b>1.13</b>	OK
		04	45.00	50.610	<b>1.12</b>	OK
		05	45.00	51.014	<b>1.13</b>	OK
		06	45.00	50.691	<b>1.13</b>	OK
		09	360.00	228.590	<b>0.63</b>	outlier
	10	360.00	231.624	<b>0.64</b>	outlier	
	W-80; 60°	07	45.00	50.250	<b>1.12</b>	OK
		08	45.00	50.694	<b>1.13</b>	OK
	N-150; 0°	11	22.50	19.929	<b>0.89</b>	OK
12		22.50	20.029	<b>0.89</b>	OK	
S-Cs; 0°	15	27.70	30.303	<b>1.09</b>	OK	
	16	27.70	30.776	<b>1.11</b>	OK	
NIR	NIR	24		ZERO		
	NIR	25		ZERO		
	NIR	26		ZERO		
	NIR	27		ZERO		
	NIR	28		ZERO		
WIR	WIR	18		8.162		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.14	0.14	0.18	0.10	38%
Sr-90/Y-90; 0°	2	1.05	1.05	1.16	0.94	15%
Sr-90/Y-90; 60°	2	0.73	0.73	0.75	0.72	3%
<b>Beta all</b>	<b>6</b>	<b>0.73</b>	<b>0.64</b>	<b>1.16</b>	<b>0.10</b>	<b>65%</b>
N-20; 0°	2	0.76	0.76	0.76	0.75	1%
W-80; 0°	8	1.13	1.01	1.16	0.63	23%
W-80; 60°	2	1.12	1.12	1.13	1.12	1%
N-150; 0°	2	0.89	0.89	0.89	0.89	0%
S-Cs; 0°	2	1.10	1.10	1.11	1.09	1%
<b>Photon all</b>	<b>16</b>	<b>1.11</b>	<b>0.99</b>	<b>1.16</b>	<b>0.63</b>	<b>20%</b>
<b>All</b>	<b>22</b>	<b>1.02</b>	<b>0.89</b>	<b>1.16</b>	<b>0.10</b>	<b>34%</b>

outliers: 4 of 22

fraction of outliers: 18%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv

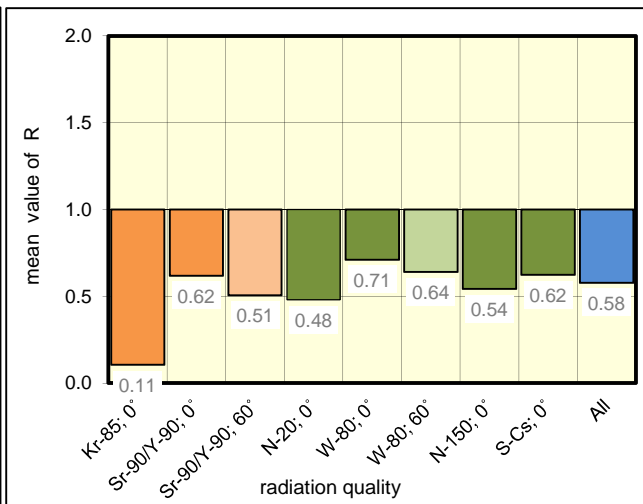
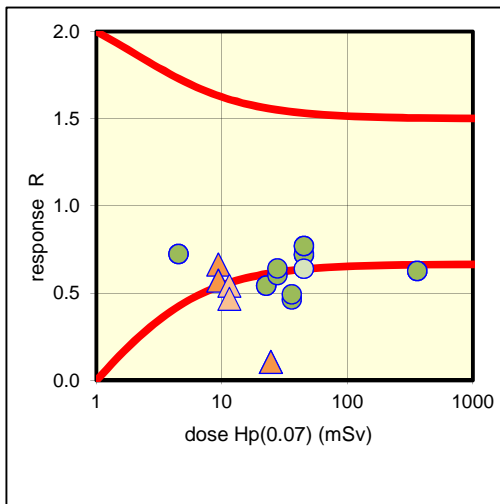
## system 59 : photon/beta dosimeter

radiation type	true values reported by the irradiating laboratory			reported by participant	result	
	radiation quality	irradiation number	dose Hp(0.07) mSv	dose Hp(0.07) mSv	response R (reported / true)	
Beta	Kr-85; 0°	21	24.60	2.600	<b>0.11</b>	outlier
		22	24.60	2.600	<b>0.11</b>	outlier
	Sr-90/Y-90; 0°	17	9.40	6.250	<b>0.66</b>	OK
		18	9.40	5.380	<b>0.57</b>	OK
	Sr-90/Y-90; 60°	19	11.50	6.250	<b>0.54</b>	outlier
20		11.50	5.380	<b>0.47</b>	outlier	
Photon	N-20; 0°	13	36.00	16.740	<b>0.47</b>	outlier
		14	36.00	17.780	<b>0.49</b>	outlier
	W-80; 0°	01	4.50	3.260	<b>0.72</b>	OK
		02	4.50	3.260	<b>0.72</b>	OK
		03	45.00	32.430	<b>0.72</b>	OK
		04	45.00	32.430	<b>0.72</b>	OK
		05	45.00	34.660	<b>0.77</b>	OK
		06	45.00	34.660	<b>0.77</b>	OK
		09	360.00	226.220	<b>0.63</b>	outlier
	10	360.00	226.220	<b>0.63</b>	outlier	
	W-80; 60°	07	45.00	28.850	<b>0.64</b>	OK
		08	45.00	28.850	<b>0.64</b>	OK
	N-150; 0°	11	22.50	12.220	<b>0.54</b>	outlier
		12	22.50	12.220	<b>0.54</b>	outlier
S-Cs; 0°	15	27.70	16.740	<b>0.60</b>	outlier	
	16	27.70	17.780	<b>0.64</b>	OK	
	NIR	23		----		
	NIR	24		----		
	NIR	25		----		
	NIR	26		----		
	NIR	27		----		
	NIR	28		----		

radiation quality	number of values	median (R)	mean (R)	maximum (R)	minimum (R)	coefficient of variation (R)
Kr-85; 0°	2	0.11	0.11	0.11	0.11	0%
Sr-90/Y-90; 0°	2	0.62	0.62	0.66	0.57	11%
Sr-90/Y-90; 60°	2	0.51	0.51	0.54	0.47	11%
<b>Beta all</b>	<b>6</b>	<b>0.51</b>	<b>0.41</b>	<b>0.66</b>	<b>0.11</b>	<b>60%</b>
N-20; 0°	2	0.48	0.48	0.49	0.47	4%
W-80; 0°	8	0.72	0.71	0.77	0.63	8%
W-80; 60°	2	0.64	0.64	0.64	0.64	0%
N-150; 0°	2	0.54	0.54	0.54	0.54	0%
S-Cs; 0°	2	0.62	0.62	0.64	0.60	4%
<b>Photon all</b>	<b>16</b>	<b>0.64</b>	<b>0.64</b>	<b>0.77</b>	<b>0.47</b>	<b>15%</b>
<b>All</b>	<b>22</b>	<b>0.63</b>	<b>0.58</b>	<b>0.77</b>	<b>0.11</b>	<b>31%</b>

outliers: 11 of 22

fraction of outliers: 50%



Results: IC2009

trumpet parameter: 1.5 / 1.0 mSv