

## EURADOS Working Group 6

### Computational Dosimetry

#### Motivation

Working Group 6 promotes scientific research and development activities in the field of Monte Carlo Modelling for Radiation Dosimetry and Protection. It carries out activities that promote good practice and advance the science in the area of computational dosimetry. All aspects of computational dosimetry applied in radiation protection and dosimetry are considered, though Monte Carlo methods are the dominant method.

#### Aims

- The Working Group performs a number of tasks in isolation from the other EURADOS Working Groups, but because of the widespread use of Monte Carlo methods, there are strong interactions with other working groups. In particular, with WG7 on in vivo monitoring; with WG10 on emergency/accident dosimetry; with WG9 and WG11 on benchmarking for high energy calculations. However, pure computational problems remain the main focus of the work programme.
- Intercomparisons form a strong part of the WG's work programme. Intercomparisons provide a picture of the accuracy with which computational methods are applied and whether best practice is being followed. Intercomparisons have been performed on neutron spectrum unfolding, linac design, micro & nano dosimetry, in vivo monitoring (with WG7) and Bonner sphere modelling for high energies (with WG11).
- Training in the use of Monte Carlo methods is an important aspect of the WG's work. Training schools on voxel phantom implementation and usage, and on individual monitoring for external dosimetry, have been held successfully or are being planned.

#### Actions

##### Completed

- Modelling of Bonner sphere responses for high energy neutrons (with WG11) - 2010
- Voxel phantom school, IRSN – 2011
- Lung in vivo measurements complemented with MC simulations (collaboration with WG7-Internal Dosimetry) – 2012
- Winter School *Status and Future Perspectives of Computational Micro- and Nanodosimetry* – AM2013
- Knee in vivo measurements complemented with MC simulations (collaboration with WG7-Internal Dosimetry) – 2014
- Voxel phantom school, HMGU – 2014

Status: July 2017

- Challenges in Micro- and Nanodosimetry for Ion Beam Cancer Therapy (MIND-IBCT), Workshop co-organized by EURADOS - 2014

### **In Progress and Ongoing**

- Neutron energy distribution unfolding intercomparison
- Micro and nano dosimetry issues
  - Fundamental issues in track structure calculations
  - Uncertainty Exercise for micro and nano dosimetric problems
  - Modelling gold nanoparticles (with WG7)
- Individual monitoring
  - Workshop in the role of computational methods in individual monitoring
  - Development of a reference computational skin model
  - Calculation of protection quantities for emergency/accident dosimetry
- Design and dosimetry assessment of a LINAC facility – Intercomparison
- VOXEL Phantoms
  - Voxel phantom training school – KIT 2018
  - Intercomparison on the implementation of the ICRP reference voxel phantoms
- High energy fields (S. Rollet, AIT, A)
  - Benchmarking for high energies (with WGs 9 and 11)
- Nuclear Medicine – collaboration with the EANM

## **Members**

### **Chairperson**

- Hans Rabus    PTB (Germany)  
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### **Full members**

- Working Group 6 has currently 15 full members from 8 countries.

### **Corresponding members**

- Working Group 6 has currently 38 corresponding members from 15 countries.

## **Additional information**

See EURADOS web site ([www.euroados.org](http://www.euroados.org)).