

IM2015

International Conference on the
Individual Monitoring
of Ionizing Radiation:

Brugge, 20th to 24th of April 2015



- Tried to focus on:
 - International aspects (not just Europe), to attract many participants
 - Scientific quality
 - Stimulate discussions
 - Social part



Statistics: contribution

- 261 accepted abstracts
 - 33 withdrawn contribution
- 69 oral presentations
- 9 invited talks
- 1 opening talk: Christian Wernli
- 2 discussion sessions
- 3 poster sessions: 161 posters

topic	Poster	oral	sessions
2	36	13	2/4/5 14/16/
3	27	11	13
4	18	8	6/8
5	21	10	11/12
6	8	4	3
7	13	5	15
8	15	8	10/7
9	14	5	9
1+10	6	3	1



Statistics: participants

- Full conference: 266
- Invited speakers: 18
- Organisers: 11
- Exhibitors: 36
- Dosimetry course only: 53
- EURADOS IC2014 only: 8
- Accompanying persons: 12
- Total: 424

Statistics: participants

1°. Belgium:	100
2°. Germany:	40
3°. France:	33
4°. Spain:	27
5°. UK:	16
6°. USA:	16
7°. Japan:	15
8°. Netherlands:	14
9°. Czech:	14
10°. Brazil:	10
11°. Poland:	10
12°. Austria:	8
13°. Finland:	8
14°. Switzerland:	8
15°. Italy:	6
16°. South Korea:	6
17°. China:	6





Statistics: gender equality?

Participants: 36% women

Posters: 30% women

Talks: 38% women

Scientific committee: 32% women

Invited talks: 11% women

Conclusions: take home messages

Christian Wernli: Why individual monitoring?

- Many changes throughout the years
- Original work and ideas were not so bad
- Quantities: Too complicated? Too many?
- “What are we doing?”





Conclusions: take home messages

Topic 1 – International and European Standard and Recommendations

Topic 10 - Education, training and networks on individual monitoring

Session 1:

- New operational quantities for external exposure are being proposed ICRU.
- An overview of the international standards (IEC) available and under revision.
- The revision of IDEAS Guidelines resulted to an improved overall structure
- “Technical Recommendations for monitoring individuals occupationally exposed to external radiation”, will bring together all requirements taking into account recent development



Conclusions: take home messages

Topic 2 – Quality Assurance, reference fields, type testing and intercomparisons

Session 2:

- There is a high demand of Intercomparison exercises: the IMS participate in all the exercises provided (whole body photons, neutrons, extremity, eye lens, environmental) and the number of participants is increasing.
- The analysis of results indicates that most IMSs perform adequately but there is room for improvements.
- Some countries are doing a big effort to cover such demand at a national level (e.g. Ukraine).



Conclusions: take home messages

Topic 2 – Quality Assurance, reference fields, type testing and intercomparisons

Session 4:

- The nature and extent of a QA program has to be appropriate to the number of workers monitored, and to the magnitude and probability of exposures expected.
- Quality assurance includes quality control, testing of equipment and procedures of the laboratories.
- Participation in national or international intercomparison exercises allows participants to compare the results with reference values, to validate analytical protocols and to help for accreditation procedures.
- Authors underline the need for close collaboration and the necessity for international cooperation especially in criticality accident and emergency preparedness, in dose assessment and accreditation processes.



Conclusions: take home messages

Topic 2 – Quality Assurance, reference fields, type testing and intercomparisons

Session 5:

- International standards (mainly IEC) play an important role for manufacturers and services in defining the state of the arts requirements of dosimetry systems.
- More detailed specific requirements for Reference radiation fields, and calibration procedures including conversion factors are needed for special cases
- Standards defining the procedure of performance tests are also in revision at the moment.



Conclusions: take home messages

Topic 3 – New developments in external dosimetry, including eye lens and extremity dosimetry

Session 13:

- The revised recommendations for a reduced limit for doses to the eye have stimulated a lot of development work to devise appropriate dosimeters for $H_p(3)$
- It appears that satisfactory dosimeters can be fabricated using existing technology, TLD, OSL, and the characteristics of various designs have been presented.
- However, the biggest problem is the different irradiation situations which make the measurements very sensitive to the position and orientation of the dosimeter,
 - when trying to measure the dose directly
 - when trying to infer it from measurements of whole body dose with a dosimeter positioned at some poorly defined position on the body.



Conclusions: take home messages

Topic 3 – New developments in external dosimetry, including eye lens and extremity dosimetry

Session 14:

- New developments with small MOSKIN detectors on the lid of the eye
- Realtime extremity dosemeter available
- Importance of correct calibration for skin dose from hot particles
- Automation of dosimetry laboratory





Conclusions: take home messages

Topic 3 – New developments in external dosimetry, including eye lens and extremity dosimetry

Session 16:

- New TLD albedo dosemeter
- Development of silicon sensor
- MOS based accumulating radiation sensitive detector





Conclusions: take home messages

Topic 4 – New developments in bio-assay, in-vivo monitoring and internal dosimetry

Session 6:

- IDEAS Guidelines are a helpful tool to guide evaluators towards a correct dose assessment, however they are no magic: they cannot correct wrong assumptions when little data is available.
- Uncertainties due to respiratory motion during lung counting are negligible compared to other common sources of uncertainties.
- Evaluation of the chest thickness by means of ultrasonic measurements is a simple and helpful tool to obtain individual specific calibration of lung measurements.



Conclusions: take home messages

Topic 4 – New developments in bio-assay, in-vivo monitoring and internal dosimetry

Session 8:

- New ICRP developments in in-vivo monitoring and internal dosimetry
 - Improved models
- Uncertainty assessment in retrospective internal dosimetry
- Personalized body counter calibration
- Biological dosimetry





Conclusions: take home messages

- Topic 5 – Individual monitoring in medicine, research and industry (nuclear, aircrew, space, NORM and other)
- Session 11:
 - The session gave an overview on a broad application field of individual monitoring:
 - Spacecraft: very high doses (up to 1 Sv expected in the Mars mission)
 - Different spectra than on earth
 - IM with albedo dosimeters: regular revision/completion of reference spectra and intercomparison exercises in workplace fields are appreciated
 - Problems turned out in practice by wearing 1 or 2 dosimeters (with aprons) in medicine



Conclusions: take home messages

Topic 5 – Individual monitoring in medicine, research and industry (nuclear, aircrew, space, NORM and other)

Session 12:

- Many efforts in eye lens dose assessment going on
- Conventional medicine is primary field of concern in many studies
- Other fields deserve attention e.g. veterinary practice





Conclusions: take home messages

Topic 6 – Dose assessment at workplaces, including exposure to radon and progeny

Session 3:

- Many occurrences of NORM: included the standard sources of radiation as well as the more diverse sources such as in the Oil & Gas industry from the scale on pipes and the waste from extraction.
 - The need for potential occupational radiation protection and monitoring program
- Also neutron monitoring still needs development





Conclusions: take home messages

Topic 7 – Computational methods in individual monitoring

Session 15:

- There is a very fast and strong evolution in the development of computational phantoms, starting from the mathematical phantoms to the body specific and very recently, posture specific phantoms
- Also a wide range of applications are presented in which calculations are used, a large part is within the medical field, including as well the design of dosimeters as radiation protection applications in general (efficiency of protection tools, calculation of organ doses). But we also have seen an application in the nuclear waste domain.
- As a conclusion, the use of computational methods becomes indispensable within the research domain of dosimetry and individual monitoring specifically.



Conclusions: take home messages

Topic 8 – Dose assessment in emergency exposure situations

Session 7:

- Dose reconstructions in emergencies has evolved from the stage of application of isolated retrospective dosimetry methods to the phase of multi-parametric approach to estimation of doses using the whole arsenal of biological and physical methods.
- The search for new methods and materials moves towards broader use of OSL and TL on various fortuitous materials (integrated circuits, resistors, glass)
- Dose assessment in an in-field exercise has shown good agreement with reference dosimetry.
- Transfer from measurable doses received by dosimetric objects (personal gadgets, blood etc) to the doses of organs of interest is getting into focus of research, providing first promising results.



Conclusions: take home messages

Topic 8 – Dose assessment in emergency exposure situations

Session 10:

- dose reconstruction with retrospective dose measurements and calculation play an important role to plan the medical treatments after radiation accidents
- EPR measurements of fingernails are a new and promising technique in retrospective Dosimetry with the potential to get a standard for dose reconstruction after radiation accidents.
- OSL Dosimetry on household salt is a sensitive technique and promising for the use in accidental Dosimetry



Conclusions: take home messages

Topic 9 – Dose records and reporting, national dose registers and other operational issues of individual monitoring services

Session 9:

- Eurados survey on Quality assurance in dosimetry: all IMS are very much aware that QA is a very important element and that almost all of them are in some way dealing with this aspect either with formal accreditation or by using different types of quality management systems.
- This point was taken up by contributions of regulators where also the aspect of QA was implemented in the approval criteria for IM Services.
- Concerning the National Dose Registers(NDR) it seems that the ESOREX methodology can be a basis for future (needed) harmonization
- Also the treatment and correction of erroneous dose values (bad controls, abnormal readouts , treatment of non returned dosimeters) seems very different for different IM service and leaves still a lot of room for harmonization.



Conclusions: take home messages

Discussion session: Sense and Non-sense of Accreditation

- Accreditation is a voluntary third-party reviewed process. There are no specific requirements in the International BSS nor in the EU BSS but several recommendations (e.g. RP160) indicating the need to have a quality management system in place and whenever possible, also the accreditation.
- ISO 17025 was recognized as the proper standard to demonstrate technical competence.
- The situation among the IMS represented in the IM2015 is reflected as follows: About 1/3th of the audience has some form of accreditation.
- Benefits of the accreditation process were highlighted and the IMS were encouraged to implement the requirements of the ISO17025.





Conclusions: take home messages

Discussion session: Eye lens dosimetry

- **General agreement:**

the recommended procedure is to decide based on results from specific measurements. Case by case decisions. Several countries have started these studies.

- **If test are not available:** literature, work-load, retrospective-data base; information is missing for some workplaces –ie glove box for neutron doses in nuclear field
- **Eye lens monitoring:**

To use a WB dosimeter outside the lead apron seems to be the solution more likely to be accepted by users and managers.

The accuracy of this approach is highly dependent on the position of the dosimeter and the workplace.

Any simplified approach other than the use of Hp(3) measured close to the eye shall need validation.

- **Guidance:** The TECDOC 1731 provides guidance to design an eye lens monitoring programme for most situations.

Awards

- 3 awards best poster (200 Euro)
- 1 award best talk (500 Euro)
- Judging done by all members of Scientific Committee



Will be presented by Patrick Van der Donckt, FANC, Federal Agency of Nuclear Control

Best Poster Award 1

Marcin Brodecki, J. Domienik, M. Zmyslone

Distribution of X-ray doses to the region of the medical staff eye lenses and extremities during interventional cardiology procedures





Best Poster Award 2

D. Souza Santos, Wielunski, Trinkl, Ruhm

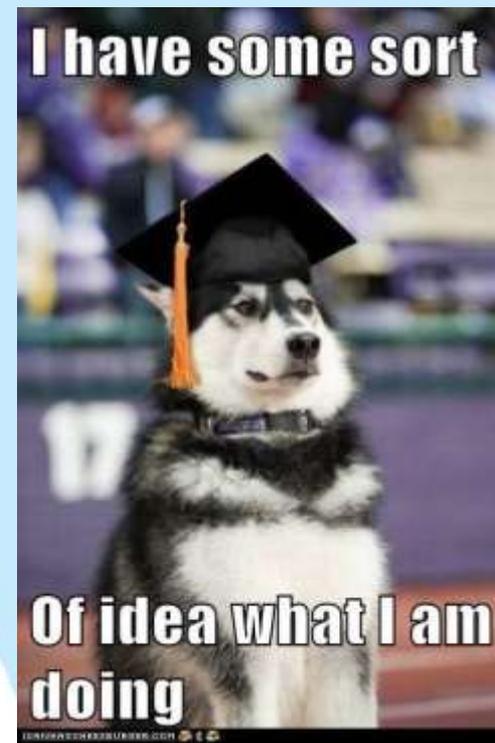
*The HMGU combined Neutron and Photon
Dosemeter*



Best Poster Award 3

**T. Vrba, P. Nogueira, D. Broggio, MA
Lopez, R. Tanner**

*EURADOS Intercomparison exercise on
MC modelling for the in-vivo
monitoring of Am-241 in skull
phantoms: overview and lessons
learned*





Best Oral Presentation Award

Jose Maria Gomez Ros

A single exposure, multi-detector neutron spectrometer for workplace monitoring



Proceedings

- Radiation Protection Dosimetry
- Special issue: 4 issue
 - Invited talks: 6 pages
 - Oral or poster presentation: 4 pages
- Submission of papers: 31st of May 2015
- All participants will get one copy (in one year...)
- Goal of review process: finished February 28th 2016
- Use the on-line system of RPD
 - ScholarOne system
 - Special Issue: IM2015
 - Guidelines:
http://www.oxfordjournals.org/our_journals/rpd/for_authors/instructions.html



Proceedings

- Consulting editor: Naomi Conneelly (RPD)
- Guest Editors: Filip Vanhavere
 - Joao Alves
 - Jean-Francois Bottollier
 - Paola Fattibene
 - Augusto Giussani
 - Colin Martin
 - Hannes Stadtmann



- Tried to focus on:
 - International, not just Europe, attract many people
 - Scientific quality
 - Discussions
 - **Social part**



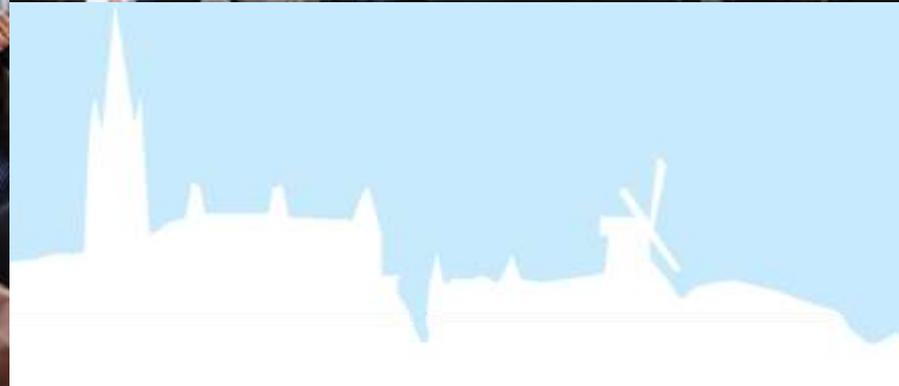
Welcome reception



City Hall reception



Social visits



Morning jogging



Conference dinner



Thanks to all sponsors and exhibitors



After 2 years of preparation...



Thank you from

Danielle, Peter, Ellen, Ann, Jef, Michel, Viviane, Lara, Anne Laure, Filip