

Workshop on X-ray imaging dosimetry

Programme draft: 2024-08-20 (subject to changes)

Place: Helsinki university hospital, Finland

When: 20 – 22 November 2024 Workshop hotel: <u>Scandic Meilahti</u>

Linked with the EURAMET 22NRM01 TraMeXI project More information: https://tramexi.com/workshop/

Wednesday: 20 November 2024

X-ray dosimetry fundamentals and codes of practice

Lunch (not included)

12:00 - 12:10 Welcome

- Dosimetry as a bridge to overall beam characterisation (10 min)
 Mika Kortesniemi HUS and Paula Toroi, HUS/STUK, Finland
 - o Traceable measurements of air kerma based quantities.
 - Complete characterisation with spectrometry.

12:10 - 13:00 Dosimetry equipment principles and operation

- Ionization chambers (ICs)and X-ray multimeters (XMMs) (20 min)
 Stefan Pojtinger, PTB, Germany
 - o Principles, performance
- Quantities and parameters beyond air kerma (20 min)
 Milos Zivanovic, VINS, Serbia and Markus Borowski, SKBS, Germany
 - Measurement of tube voltage related quantities
 - o Other quantities
- Calibration (10 min)

Leon de Prez, VSL, the Netherlands

o Primary standards, calibration conditions, assumptions, certificate

13:00 – 13:30 Introduction on imaging modality specific measurement procedures 1.

- Overall introduction (20 min)
 - Luigi Rinaldi, OPBG. Italy
 - General measurement protocols, TRS-457
 - Conventional projection X-ray
 - What will change when XMMs are used instead of IC
- Discussion (10 min)

Coffee break 13:30-14:00

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EUROPEAN PARTNERSHIP



The project has received funding from the European Partnership on Metrology, co-financed from the European Union's Horizon Europe Research and Innovation Programme and by the Participating States.





14:00 -15:40 Developments in mammography dosimetry

- 14:00 15:00 New CoP: EFOMP-AAPM breast dosimetry protocol (60 min) loannis Sechopoulos, the Netherlands
 - o Dosimetry model
 - Measurement of air kerma
 - Standard, contrast-enhanced and tomosynthesis
 - Determination of AGD
- 15:00 15:20 Novel radiation qualities and spectra measurements (20 min) Elisabeth Salomon, PTB, Germany
 - Range of radiation qualities
 - o Spectrometry methods
 - XMM results
- 15:20 15:30 XMM results in mammography (10 min)
 Andrea Kojic, VINS, Serbia
- Discussion (10 min)

Break 15:40-16:00

16:00 - 16:30 Introduction on imaging modality specific measurement procedures 2.

- Interventional (including C-arms, CBCT), (15 min) Jouni Uusi-Simola, HUS, Finland
- CT (including wide beams) (15 min) Mika Kortesniemi, HUS, Finland

16:30 -17:00 Clinical usage of calibration certificate

- How to use calibration certificates in clinical practice (20 min)
 Nikola Kržanović, VINS, Serbia / Paula Toroi, STUK/HUS, Finland
- Discussion (10 min)

17:00 – 18:00 Dosimetry companies presenting their products

- List later...(5-10 min each)
- Discussion 10 min

Social event 18:00 -

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Thursday: 21 November 2024

Practical approach and uncertainties

9:00 – 10:30 Patient specific dosimetry

- What is patient dose? (20 min)
 Bente Konst, Vestfold, Norway and Linköping, Sweden
 - Measurable quantity vrs. Organ doses
- MC simulations: skin dose in interventional radiology (30 min) Jonas Andersson, University of Umeå, Sweden
- Use of AI in dosimetry (30 min) Satu Inkinen, HUS, Finland
- Discussion (10 min)

Coffee break 10:30-11:00

11:00 - 12:30 Uncertainties

- Theory and practice for air kerma and HVL (30 min) Aino Tietäväinen, STUK, Finland
- Practical example for clinical measurements (20 min)
 Niko Kiiskinen, HUS, Finland
- Practical example for skin dose (30 min)
 Jonas Andersson, University of Umeå, Sweden
- Discussion 10 min

Lunch break 12:30 - 14:30

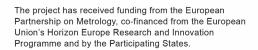
Long lunch break with a walk outside

14:30 – 18:00 Practical exercises

- Practical exercises (video connection) 14:30 16:30
 - Measurement group: 1 with camera, 2 persons measuring.
 - Conventional 25 min video+25 min for the analysis of results
 - Interventional 25 min video+25 min for the analysis of results
 - Mammography 25 min video+25 min for the analysis of results
 - Moderator: 1 person the meeting room
 - Short breaks between
- Practical: calculation of uncertainties 1 16:30 18:00
 - Using the data collected in the practical session
 - Additional data from TraMeXI group

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Friday: 22 November 2024

Plans for future: targets and aims

9:00 - 10:00 Feedback,

- Update of Code of Practice Miloš Živanović, VINS, Serbia
 - Summary from discussions on practical sessions
 - Feedback on update of protocols (to TraMeXI)

10:00 - 11:00 Invited lecture

 Deep learning-powered multimodality medical imaging Prof. Habib Zaidi, Geneva, Switzerland

Coffee break 11:00-11:30

11:30 - 13:00 What is our target?

• Short introduction (30 min)

Miloš Živanović, VINS, Serbia and Markus Borowski, SKBS, Germany

- O Why we do dosimetry?
- o How we use dosimetric data?
- o what are current target uncertainties and why?
- o what is expected clinically?
- o what is currently provided by the manufacturers and calibration laboratories?
- Discussion (50 min)
 - O What should be the target uncertainty?
 - o What is clinically needed?
 - o What is expected for different purposes (QA, research, optimization)?
- Conclusions and Farewell (10 min)

Mika Kortesniemi HUS and Paula Toroi, HUS/STUK, Finland

The workshop ends.

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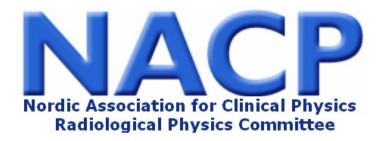








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To be added later

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