Progress Report on the Radiation Dosimetry at OMH

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Gamma-ray dosimetry

- A new protection level irradiation facility is available at the OMH. The new equipment supplied with two ^{137}Cs and one ^{60}Co sources, low scattering collimator and two lead filters can cover the air kerma rate range from 1 μGy/h to-0.6 Gy/h using the 1 m-10 m source detector distance. The project will be finished in 2003 with installing a remote controlled automatic measuring car to support the dosemeters calibration service.

X-ray dosimetry

- The participation in EUROMET project numbers 526 shows that the mammographic ionization chamber calibration is possible using tungsten anode tube with 60 μm molybdenum filtration (IEC 1223) or CCRI 25kV or ISO 4037 H-30 beam qualities within 3% uncertainty, if the chamber has small energy dependence of its response. These qualities have been standardized at OMH.
- The high voltage of the Philips MCN 321 type X-ray tube was controlled by photon spectra measurement. The nominal voltages agreed within 1% with the cut off energies of spectra.

Legal metrology

- Type testing of new dosemeters for medical (RADCAL 9015), personal (MGP DMC 2000S; EPD-2.03) and protection (Victoreen 451P, 470 A; MGP GIM-204; Eberline FH-40 GL-10) proposes has been continued.

International activities

- A key comparison was carried out between the OMH and the BIPM of standards of absorbed dose to water for ^{60}Co-rays, using two different ionisation chambers as transfer standards. The mean comparison result derived from the two sets of calibrations shows that the OMH determination of absorbed dose to water, using the scaling theory, is 0.17% lower than the BIPM value.
- The CMC data file of the section has been revised and excepted by the EUROMET.
- The air kerma irradiations of TLDs for the IAEA SSDL service have being continued.

Publications

- D.T. Burns and I. Csete
  Comparison of the air kerma standards of the OMH and the BIPM in the low-energy X-ray range Rapport BIPM-02/12
- Allisy-Roberts, I. Csete
  Comparison of the standards of absorbed dose to water of the OMH and the BIPM for 60Co γ rays Rapport BIPM-03/X (in press)
- Büermann, H.-M. Kramer and I. Csete
  Results supporting calculated wall correction factors for cavity chambers. PMB (in press)
- Büermann, H.-M. Kramer and I. Csete
  Comparison of the PTB and OMH air kerma Standards for ^{60}Co and ^{137}Cs gamma radiation, PTB Bericht PTB-Dos-40
- István Csete (OMH), Ludwig Büermann (PTB)
  Recent developments and current status of air kerma standards (invited paper) Proceeding of International Symposium on Standards and Codes of Practice in Medical Radiation Dosimetry 25–28 November 2002. Vienna, Austria"
- J. Witzani , I. Csete , H. Bjerke , F. Bochud ,, M. Denoziere , W. de Vries , J. Dobrovodsky, K. Ennow, J. E. Grindborg, C. Hourdakis, A. Kosunen , H. M. Kramer, F. Pernicka, Th. Sander
  Calibration of dosemeters used in mammography with different X-ray qualities (Final report of EUROMET project no. 526) Rad. Prot. Dos. (in press)

Future works

- Determination of radiation characteristics (beam profile, spectra etc.)of the new gamma irradiation equipment.
- Determination of absorbed dose to water by graphite extrapolation chamber in the medium energy X-rays.

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