

Progress report on the photon dosimetry at CMI
(April 2009)

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Maintenance and development of standards

Monte Carlo simulations

In 2008 a new BEGe spectrometer was bought, so currently a simulation of this detector has been prepared.

Purpose: to obtain a response matrix of the detector, which is supposed to be used for the photon energy distribution measurement in collimated X-ray beams.

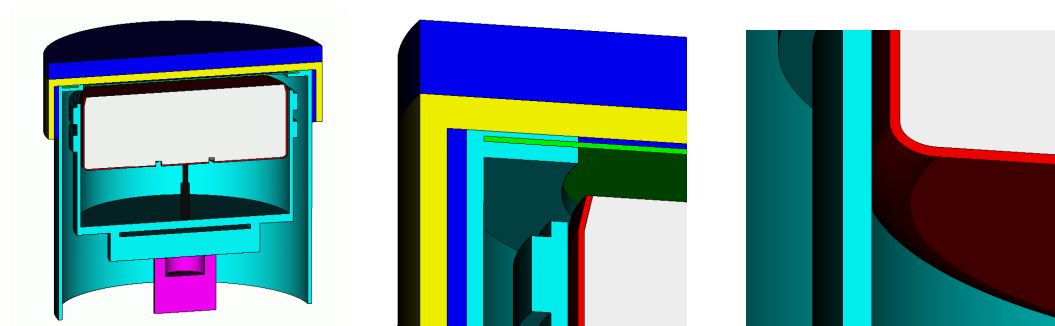
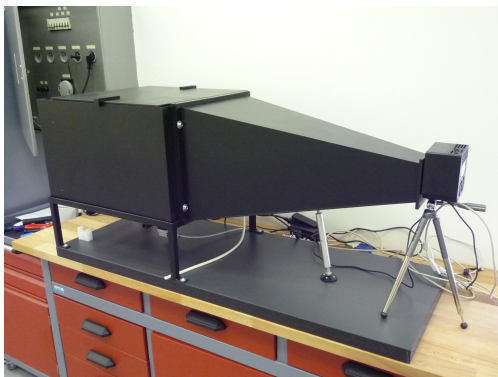


Fig.: Simulation of the BEGe detector (some details)

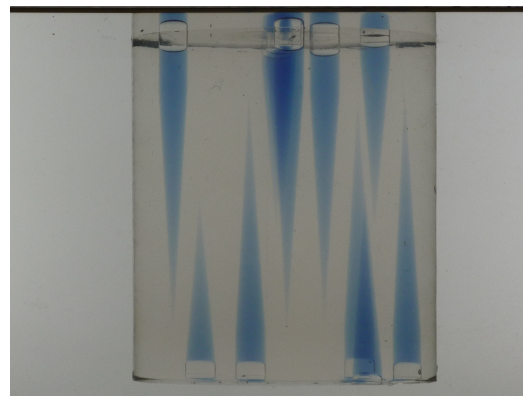
Development of optical computed tomography

As a part of JRP06, optical cone-beam computed tomography has been developed since 2007.

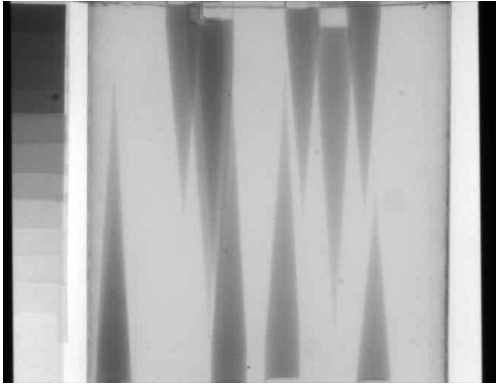
Purpose: Determination of 3D dose distribution in the near surrounding of brachytherapy sources using radiochromic gels.



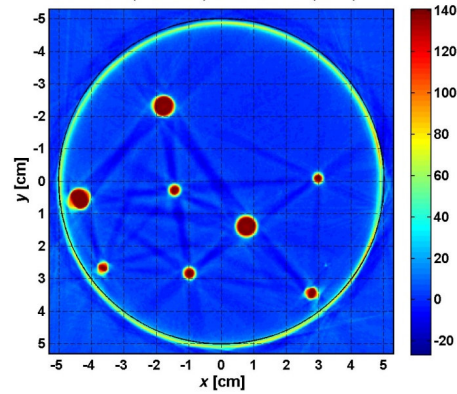
CT scanner, general view



Dummy model of a gel dosimeter
for spatial resolution determination



Photograph of a dummy model



Reconstruction of “irradiated” areas

International activities

CMI photon dosimetry laboratory regularly participated in the TLD audit organised by IAEA for the SSDLs.

CMI participated in the Euromet project No. 738 (comparison, pilot laboratory - PTB).

Services performed

Routine verification and calibration of measuring instruments according to the Czech Metrology Act (the main task of CMI).

- Calibration of irradiation facilities (3 visits) in other authorised metrology centres
- Verification of measuring instruments acc. to the Czech Metrology Act (yearly appr. 400 instruments for radiation protection, 15 standard class instruments for radiotherapy, 20-30 instruments for X-ray diagnostics, 2-3 systems of personal integral dosimetry (films and TLDs))
- Type approval of measuring instruments (13 new approvals) acc. to the Czech Metrology Act

In August 2007, the reference chamber NE 2571 (0.6 ccm) was calibrated at the BIPM primary laboratory in terms of absorbed dose in water.

Personnel

Current status of the staff in the photon dosimetry laboratory of CMI is as follows:

2 scientists, 2 technicians, 1 secretary (all FTJ)