

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

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MLL-KOLLOQUIUM

Donnerstag, 15.01.2015, 16¹⁵ Uhr

Seminarraum 127, TUM, Physik II, Erdgeschoss/Nord
Treffen zum gemeinsamen Kaffee 16 Uhr

Dr. Hugo Palmans

(National Physical Laboratory (London/UK) and MedAustron (Austria))

Challenges for reference and relative dosimetry of novel, scanned or pulsed particle beam modalities

With the publication of the IAEA report TRS-398 about 15 years ago, reference dosimetry of proton and carbon ion beams used in radiotherapy was treated for the first time on an equal level as that of photon and electron beams albeit with larger uncertainties due to the available data. In the meantime, a range of new treatment techniques using light-ion beams has been introduced or proposed, such as scanned beams and laser-induced beams. This has raised new dosimetric challenges not addressed by TRS-398. In addition, it has been recognized since long that the conventional macroscopic quantity of absorbed dose has to be complemented with information of ionization on the micro- and nano-scale to correlate the physics of ionizing radiation with its biological effect adequately. This presentation reviews the dosimetric challenges for these novel modalities and the status of research efforts by the National Physical Laboratory and MedAustron addressing these for the application of primary standard calorimeters and ionisation chambers for reference dosimetry, gas-, liquid- or solid-state-based dosimeters for relative dosimetry and detectors for micro- and nanodosimetry.

gez. Peter Thirolf
Tel. 289-14064

gez. Norbert Kaiser
Tel. 289-12367