MEDIZINISCHE UNIVERSITÄT WIEN

TECHNISCHE UNIVERSITÄT WIEN

Invitation to the seminar on

Medical Radiation Physics and Ion-Beam Therapy

by

Dieter Röhrich
University of Bergen, Norway

The Bergen proton CT: quasi-online dose plan verification and online range monitoring

A proton-CT scanner provides direct, quasi-online information about the stopping power of tissue and has the potential to reduce range uncertainties significantly. For a proton-CT scan, protons or alpha particles need to be energetic enough to traverse the patient completely. The trajectory of every outgoing proton, as well as the residual energy/range, is measured. The calculation of the proton trajectory inside the target region and the measured residual proton energy/range provide a 3D-map of the relative stopping power. A (clinical) prototype of a pCT-scanner is being constructed at the University of Bergen. A complete CT reconstruction of a simulated anthropomorphic pediatric head phantom shows that a spatial resolution of 1-2 mm and a Water-Equivalent-Thickness (WET) precision of 1-2 mm can be achieved, sufficient for proton therapy treatment planning. During treatment, a shower of secondary particles is emitted into the forward region and thus into the acceptance of the pCT apparatus. Simulation studies with the head phantom show that by analyzing the size and shape of the shower, the Bragg-peak inside the phantom can be localized with a sub-millimeter precision in real-time. Beam tests have confirmed this strong correlation between proton beam range and forward neutrons and gammas.

Tuesday, 24. November 2026, 09:00 am

Zoom:
https://tuwien.zoom.us/j/69660150906?pwd=FQRS8TnWx4hGuNEqjmVLfYostoOXLW.1

For updates, please register at: https://list.tuwien.ac.at/sympa/info/medaustron-seminar

Full programme and infos: https://indico.global/category/1500/

D. Georg & P. Kuess (MedUni Wien) A. Hirtl (TU Wien)