

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 31.01.2013, 16¹⁵ Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

Dr. Christian Graeff
(GSI, Darmstadt)

Ion beam therapy: Treatment planning and delivery for moving targets

The inverted dose profile of ion beam therapy offers the possibility of highly conformal dose delivery, sparing organs at risk while delivering high doses to the target. For several types of cancer, a considerably higher efficacy in comparison to photon therapy could be shown. Specific measures are needed to potentially transfer this advantage also to tumors with inter- and intrafractional motion. Ion beams regardless of the delivery technique show a high sensitivity to the radiological depth of the target, which will change when the target moves. For scanned delivery, the movement of the pencil beam interferes with the target motion, creating a highly variable pattern of over- and underdoses, the so-called interplay effect. In this talk, several countermeasures to the motion-related issues will be reviewed, such as gating, tracking, rescanning. Methods for the precise calculation of 4-D dose distributions either for dose verifications or planning studies will be presented, as well as recent clinical applications at Heidelberg Ion Beam Therapy Center. Furthermore an outlook on research of specific 4-D optimization methods for treatment planning and treatment of non-cancer targets will be given.

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