FAKULTÄT für PHYSIK
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MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
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MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 08.02.2018, 16^{15} Uhr

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

Prof. Marco Riboldi

(LMU München)

Modelling approaches for motion management in external beam radiation therapy

Advanced treatments for cancer therapy with conventional X-rays and ion beams require accurate image guidance methods. In recent years, technological developments have led to the effective integration of image guidance in the treatment workflow, aiming at reduced uncertainties in treatment delivery. For treatment sites where breathing motion is significant, however, the acquisition of accurate 3D motion information in real-time is challenging. Severe limitations exists in terms of imaging dose requirements for X-ray based techniques, and due to the inherent trade-off between spatial and temporal resolution in non-ionizing imaging methods. A number of model based approaches have been proposed to bridge this gap, relying on quantitative descriptions of breathing motion based on treatment planning images, which are updated as a function of external (or internal) surrogates measured during treatment. In this presentation, I will discuss recent developments in motion modelling for external beam radiation therapy applications, with a specific focus on validation issues. Different approaches will be presented, including external surrogates, X-ray imaging, and novel MRI-guided strategies toward effective motion management. Potential drawbacks of motion modelling approaches will be also overviewed, discussing their ability to capture breathing pattern changes over time.

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