

New planning concept for online adaptive and online monitored MR-linac radiotherapy

Project Description

Radiotherapy with online magnetic resonance (MR) image guidance has recently become commercially available and the clinical implementation is in progress worldwide. The ability to continuously image the irradiated volume while treating the patient in combination with the ability for online adaptation requires a new paradigm for treatment planning and dose delivery. The overall objective of this PhD therefore is (i) to define and evaluate the geometric and temporal uncertainties in online MR guided and online-adapted radiotherapy, and (ii) transform the found uncertainties into new planning approaches, and iii) evaluate the dosimetric impact of the new planning approaches. The end goal is a new set of guidelines for treatment planning of online-adapted and internally gated radiotherapy treatments.