

At the UMC Utrecht, the Netherlands we have constructed a prototype MRI accelerator. The design is a 6 MV Elekta (Crawley, U.K.) Compact accelerator combined with a modified 1.5 T Philips Achieva (Best, The Netherlands) MRI system. The systems run according to our specifications. The simultaneous operation is shown by performing diagnostic quality 1.5 T MRI with the radiation beam on. As designed the interference between the two systems is completely suppressed, no interference was found.

The integrated 1.5 T MRI system and radiotherapy accelerator allow simultaneous irradiation and MR imaging. Both systems operate independent and no synchronization is required. The full diagnostic imaging capacities of the Philips MRI can be used, dedicated sequences for MRI guided radiotherapy treatments will be developed.

This proof of concept opens the door towards a clinical prototype to start testing MRI guided Radiotherapy (MRIGRT) in the clinic.

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