

## Physikalisches Kolloquium

**Andreas Peters, HIT Heidelberg**  
**»HIT: An Accelerator Facility for Tumor Treatment«**

*Einführung: A.S. Müller*

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Since ten years nearly 6000 patients have been treated at HIT (Heidelberg Ion-beam Treatment Centre), the first dedicated European particle therapy facility. It consists of three ECR ion sources for the production of p, He, C and O ions and a linac (with a RFQ and an IH-DTL cavity) to accelerate the beam to a fixed energy of 7 MeV/u. The following synchrotron is able to accelerate e.g. C ions up to 88 - 430 MeV/u, which corresponds to a penetration depth of 2 - 30 cm in water (90% of the body!). The functionalities of the accelerator parts will be described.

The produced ion beams are guided to three treatment rooms, two horizontal places and a gantry, which can provide beams from all directions (360°) to irradiate tumors. About 2/3 of the beam time - HIT is operated in 7/24 mode on 335 days per year - is dedicated to patient treatment and the linked quality assurance procedures.

The rest of the beam time is used for experiments in a separated irradiation room and for accelerator tuning and machine development. Some examples of these research activities like intensity feedbacks, detector technology, quality assurance (QA) and their interdependencies will be reviewed. Furthermore, latest and ongoing developments like the multiple energy operation in one synchrotron cycle and the linked control system upgrade will be presented.

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**Freitag, 06.12.2019, 15:45 Uhr,**

**KIT, Campus Süd,  
Otto-Lehmann-Hörsaal, Physik-Flachbau (Geb. 30.22).  
Anschließend Nachsitzung.**