
Imaging with ion beams at MedAustron

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Abstract

MedAustron is a synchrotron based particle therapy centre located in Wiener Neustadt, close to the capital of Austria. At MedAustron, proton beams with energies up to 252.7 MeV are used for cancer treatment. The facility also features a unique beam line exclusively for non-clinical research. This research beam line is currently being commissioned for even higher proton energies of up to 800 MeV. Additionally, all beam lines at MedAustron will be able to provide carbon ions of up to 400 MeV/u by the end of 2019.

This contribution introduces the possibilities for performing non-clinical beam tests at MedAustron in general. Also our development efforts towards an ion beam computed tomography system suitable for clinical use will be presented. Our research group has started working on a prototype using silicon strip detectors for tracking. First results of a track-based multiple scattering tomography with proton beams will be shown.

To determine the residual energies of ions, a stacked calorimeter has been included into the setup. This calorimeter was originally built to measure proton energies up to 150 MeV only, therefore, an upgrade solution for 800 MeV, based on Monte Carlo simulations is currently being investigated.

Finally, first reconstruction attempts, based on Geant4 data, have been performed using TIGRE (Tomographic Iterative GPU-based Reconstruction Toolbox) and will be presented.

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