

## Beam optics studies for GaToroid

*Wednesday, 6 October 2021 15:00 (15 minutes)*

**Abstract:**

GaToroid is a novel concept of a beam delivery system for hadron therapy. It comprises toroidal magnets to bend and focus the beam onto the patient location from a discrete number of directions. As GaToroid operates in a steady-state and consists of superconducting magnets, it can significantly reduce the complexity, cost, weight, and footprint of charged particle therapy systems.

Recent progress on the beam dynamics studies for GaToroid is presented. The incoming angles, and hence the reference trajectories for beams of various energies, are automatically determined. Subsequently, 3D particle tracking studies are performed to understand the beam optics to the first order. The linear transport matrix coefficients offer insights into the beam behaviour in the complex system and point towards the design optimization of the magnetic coils. Ultimately, some considerations on the upstream beamline elements are shown.

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