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## Start-to-end tracking of therapeutic ion beams in BDSIM

*Thursday, 11 May 2023 16:30 (2 hours)*

BDSIM is a Monte Carlo simulation program for start-to-end particle tracking through 3D models of particles accelerators. Based on the Geant4 toolkit, BDSIM provides a holistic approach to accelerator modelling by using Geant4's particle-matter interaction physics with dedicated accelerator tracking routines for beam vacuum transport. Subsequently, the ability to model the hits, losses, & energy deposition throughout a machine makes BDSIM highly suited for modelling medical accelerators where beam transmission, target dosimetry, and shielding requirements often need to be considered simultaneously. This has already been demonstrated by BDSIM's adoption in modelling proton therapy beam lines. The growing recognition of ions as a treatment modality that offers a potentially significant improvement in relative biological effectiveness is driving an increase in the number of planned carbon ion therapy centres. The technology to deliver ion beams, however, is prohibitively expensive and remains a challenging research topic. Here, we show the first demonstrations of therapeutic ion tracking in BDSIM in an example model developed for showcasing BDSIM's medical accelerators simulation capabilities.

### Funding Agency

### Footnotes

### I have read and accept the Privacy Policy Statement

Yes

**Primary author:** SHIELDS, William (Royal Holloway, University of London)

**Co-authors:** BOOGERT, Stewart (Cockcroft Institute); NEVAY, Laurence (European Organization for Nuclear Research)

**Presenter:** SHIELDS, William (Royal Holloway, University of London)

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