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The Trajectory Simulation and Optimization of Ion Source Chimney for SC200 Cyclotron

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SC200 is an isochronous cyclotron which generate 200 MeV, 500 nA proton for particle therapy. As an important component of the cyclotron, the ion source chimney needs to be tested and optimized. The simulation results and optimization of ion source in test-bed for SC200 are described in this paper. The simulation results show that the extraction slit with different sizes and shapes has an influence on the emittance of the extraction beam. To verify the simulation results, the performance of the designed ion source chimney with optimized slits was measured, including the beam current intensity and the beam emittance.

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