

Beam dynamics simulation through optimized extraction system of MSC-230 cyclotron for proton therapy.

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The dynamics of a proton beam of MSC-230 cyclotron were simulated from ion source to the accelerator's exit. Since the maximum current of the cyclotron is limited by extraction efficiency another approach was used which assumes the beam motion to be started from the electrostatic deflector entrance with an emittance equal deflector's acceptance and to be passed through the whole extraction system in order to investigate the losses and maximal emittance caused by extraction only. In the particle tracking simulations, the results of the computer modeling of the electrostatic deflector and the magnetic channels were used, obtained in a shape of 3D electromagnetic field maps in CST Studio Suite.

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