

SERVICE DE METROLOGIE NUCLEAIRE

Proton therapy beam transport line optimization

(in collaboration with IBA-group)

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In a protontherapy center, the protons are transported from the cyclotron to the patient that will be treated by a beam line composed of dipoles and quadrupoles magnets as well as collimators and other devices.

The goal here is to study the impact of the different parameters of the different devices on the stability of the optics of the beam line. For example, if one of the quadrupoles is misplaced, what would be the impact on the beam size in the patient?

This project will first request to understand how the beam transport is done on an IBA protontherapy center as well as how the simulator works, what physics is behind it. It will then be necessary to work on a few easy examples with the simulator before really studying the impact of the different parameters. Another exercise could be to find a new optical solution for the beam transport line so that at low energy the beam size is smaller (with probably a loss of efficiency).

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