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ELIMED: a Future Hadrontherapy Concept Based on the Laser-Driven Beams

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Laser accelerated proton beams have been proposed to be used in different fields of research. In particular, a great interest has been focused in the possibility of replacing conventional accelerating machines with laser-based accelerators in order to develop a new concept of hadrontherapy centers which could result more compact and cheaper.

In this context a research project has been launched by INFN-LNS researchers from Catania (IT) and FZU researchers from Prague (Cz) aiming to demonstrate the clinical applicability of optically accelerated protons. Surely, several tasks, going from the laser-target interaction to the dosimetry, need to be fulfilled in order to reach this goal. Great importance has the design and realization of a transport beam-line able to give to the beam the right characteristic in terms of energy spectrum and angle distribution in order to perform dosimetric tests both on detectors and on cells. A group from LNS is in charge for the realization of an energy selector system (ESS) that will be the main component of the transport beam-line.

This work will report the studies carried out on the ESS using GEANT4 Monte Carlo code which gives important information on the design optimization and also comparisons with some experimental results.

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