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Abstract The EN-STI-EET group is currently working on implementing a Monte Carlo Treatment Planning System (MCTPS) for proton therapy based on FLUKA. Since physics simulations are extremely CPU intensive, a full Monte Carlo based TPS will be almost unaffordable if no any sophisticated optimization is employed. In this project the Intel Xeon Phi coprocessor will be tested as a tool to speed up the pre-optimization of a Treatment Plan. Firstly, a tool to evaluate the fitness score of a solution will be built and, in the second part of the project, a genetic algorithm and a steepest descent algorithm will be implemented to optimize the treatment.

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