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Training of a Neural Network to Model the MYRRHA LEBT for Reliability Improvements

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The MYRRHA (Multi-purpose hYbrid Research Reactor Reactor for High-tech Applications) linear accelerator has to meet very high reliability and stability requirements, i.e. during one operating cycle of 3 months a maximum of 10 beam trips longer than 3 seconds are allowed. To meet this requirements, multiple innovative solutions are planned such as redundancies and an optimized control system. This is especially the case for the tuning and control of the injector beam dynamics to minimize beam losses in the following elements of the linac. Here we present a potential solution by tuning a beam dynamics model of the MYRRHA low energy beam transport line based on neural network and supervised learning. The performances of a neural network trained using experimental data are presented and discussed.

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