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Non-linear optimization of Iranian Light Source Facility storage ring using MOGA

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Nonlinearities pose several challenges for accelerator physicists. In order to optimize nonlinearities in the lattice and improve the dynamic aperture (DA) and lifetime of the lattice, the designer utilized a variety of algorithms and trial and error methods. The Multi Objective Genetic Algorithm (MOGA) is a commonly used method for optimizing lattice nonlinearities. This technique involves tracking particles to select the working tuning points and the multipole strength to improve DA and Momentum Acceptance (MA). This paper briefly summarizes the preliminary optimization study on nonlinearities utilizing MOGA in the ELEGANT accelerator simulation code. We used the Turin System at the Iranian Light Source Facility (ILSF). Our primary objective was to determine the optimal strength for three families of employed octupoles in the ILSF lattice. The last DA and lifetime of the beam are studied, and the RDTs are estimated.

Footnotes

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Paper preparation format

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Asia

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