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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, thereby improving DA and Momentum Acceptance (MA). This paper provides a summary of the preliminary optimization study on nonlinearities using 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 is studied, and the RDTs are estimated.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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