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Preliminary lattice design for Australian Synchrotron 2.0

Tuesday, 21 May 2024 16:00 (2 hours)

A new project is underway to develop the successor to the current Australian Synchrotron. The new storage ring is proposed to be 450 m in circumference operating at 3 GeV. A preliminary 7BA lattice has been designed which utilizes the higher-order achromat (HOA) scheme to suppress strong sextupole driving terms. The lattice has 24 sectors and a natural horizontal emittance of 50 pm-rad. This is achieved using a combination of strong combined function magnets and reverse bending magnets in the unit cell, as well as careful tuning of the bending angles to preserve positive momentum compaction factor. The dynamic aperture, momentum aperture and Touschek lifetime have been optimized by tuning the linear optics and sextupole strengths with a multi-objective genetic algorithm.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

Asia

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