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Design of prototype magnet for FETS-FFA

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Capable of achieving a high repetition rate with strong focusing, Fixed Field Alternating gradient (FFA) accelerators have the potential to be used for pulsed high intensity operations. With no pulsed high intensity FFA ever built so far, a prototype machine called FETS-FFA has been proposed to study the FFA option for the next generation spallation neutron source (ISIS-II). One of the essential components of this machine will be the main magnets which must satisfy the following conditions: zero chromaticity during acceleration, flexibility in operating tune point to test dynamics for high beam intensity and a large dynamic aperture to avoid uncontrolled loss. The chosen lattice design utilizes spiral magnets to provide edge focusing to focus in the vertical direction while also introducing a reverse bending magnet to better control the vertical tune. A three-dimensional study is being carried out in OPERA 3D software to investigate the parameters of the magnets to achieve the required field. The details on the design will be presented in this paper.

Footnotes

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Europe

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