

Influence of Nonlinear Multipole Fields on Beam Loss in the Slow Extraction from JHF Main Ring,

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- In the 50-GeV Main Ring (MR) in proposed Japanese Hadron Facility (JHF), a slow extraction technique with the half- or third-integer resonance is used to supply the beam to an experimental hall. From radioactivity point of view, beam loss less than 1% is required for the slow extraction of a 10 micro-A average current. In present design, septa are an electrostatic septum (ESS) and five magnetic ones (MSs), and the ESS and MSs are placed in different ones of four straight section. The main beam loss in the slow extraction is caused at the ESS wires. This process was investigated by a tracking simulation. In the third-integer extraction, multipole fields in the lattice magnets cause a serious beam-loss increase. Methods to cure it are proposed in this paper. Comparison with the half-integer extraction will be also done.