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Beam-Induced Energy Deposition in Muon Storage Rings*

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Beam-induced radiation effects have been simulated for the 20 to 50 GeV muon storage rings designed for a Neutrino Factory. It is shown that by appropriately shielding the superconducting magnets, quench stability, reasonable dynamic heat load and low residual dose rates can be achieved. Alternatively, if a specially-designed combined function magnet without superconducting coils on the magnet's mid-plane is used, then much of the energy is deposited in the warm iron yoke or outer cryostat layers. In addition to the component irradiation analysis, studies on tunnel shielding showed that unlimited occupancy areas can be maintained during machine operation if such enclosures are placed to the inside of the ring.

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