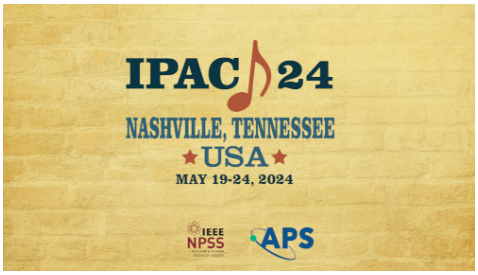


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# Radiation shielding studies for superconducting magnets in multi-TeV muon colliders

*Wednesday, 22 May 2024 16:00 (2 hours)*

Circular muon colliders provide the potential to explore center-of-mass energies at the multi-TeV scale within a relatively compact footprint. Because of the short muon lifetime, only a small fraction of stored beam particles will contribute to the physics output, while most of the muons will decay in the collider ring. The resulting power carried by decay electrons and positrons can amount to hundreds of Watt per meter. Dedicated shielding configurations are needed for protecting the superconducting magnets against the decay-induced heat and radiation damage. In this paper, we present generic shielding studies for two different collider options (3 TeV and 10 TeV), which are presently being explored by the International Muon Collider Collaboration. We show that the key parameter for the shielding design is the heat deposition in the magnet cold mass, which will be an important cost factor for facility operation due to the associated power consumption.

## Footnotes

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