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Thermal analysis of rotating single slice graphite target system for FRIB

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The Facility for Rare Isotope Beams (FRIB) is a high power heavy ion accelerator facility at Michigan State University completed in 2022. Its driver linac is designed to accelerate all stable ions to energies above 200 MeV/u with beam power of up to 400 kW. Currently FRIB is operating at 10 kW delivering various primary beams. The target absorbs roughly 25% of the primary beam power and the rest is dissipated in the beam dump. This paper presents a brief overview of the current production target system and details the thermal analysis ANSYS simulations utilized for temperature and stress prediction. The existing single-slice rotating graphite target can accommodate up to 40 kW for lighter beams, with a planned transition to a multi-slice concept.

Footnotes

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