

Design and analysis of a HTS internally cooled cable for the Muon Collider target magnet

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The Muon Collider is one of the options considered as the next step in High Energy Physics. It bears many challenges, last not least in superconducting magnet technology. The target solenoid is one of them, a channel of approximately 18 m length consisting of co-axial solenoids with a 1.2 m free bore and peak field of 20 T, submitted to large radiation heat load, dose, and damage. We describe here the conceptual design of the solenoid, focusing on the HTS cable design, which is largely inspired by the VIPER concepts developed at MIT. In particular, we show how to address margin and protection, cooling and mechanics specific to the HTS cable selected.

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