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ID: 2815 Update on the Modification and Testing of the MICE Superconducting Spectrometer Solenoids

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Abstract The Muon Ionization Cooling Experiment (MICE) is an international effort sited at Rutherford Appleton Laboratory, which will demonstrate ionization cooling in a segment of a realistic cooling channel using a muon beam. A pair of identical, 3-m long spectrometer solenoids will provide a 4-tesla uniform field region at each end of the cooling channel. The emittance of the beam as it enters and exits the cooling channel will be measured within the 400 mm diameter magnet bores. The magnets incorporate a three-coil spectrometer magnet section and a two-coil section that matches the solenoid uniform field into the MICE cooling channel. The cold mass, radiation shield and leads are kept cold by means of a series of two-stage cryocoolers and one single-stage cryocooler. Previous testing of the magnets had revealed several operational issues related to heat leak and quench protection. A quench analysis using Vector Fields software and detailed heat leak calculations have been carried out in order to assess and improve the magnet design. Details of the analyses and resulting magnet design modifications along with an update of the magnet assembly and testing progress will be presented here.

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