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Test of HTS Demonstrator Coils at High Field and Variable Temperature in the SULTAN Facility

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The testing capabilities of SULTAN have been recently expanded by installing a removable cryostat, which enables the test of accelerator relevant conductors and small insert coils at variable temperature and with a background field of 10.9 T. The cryostat is equipped with High Temperature Superconductor (HTS) current feedthroughs, which can provide 9.5 kA at 50 K to the sample. A series of sub-scale racetrack coils (referred to as FeaTHeR-M0 coils) has been produced at CERN. These coils are wound with REBCO-Roebel cable and aim at testing fabrication techniques, and gaining experience in quench detection and protection. The coils FeaTHeR-M0.4 and M0.5 have been recently tested in SULTAN at high field and temperatures between 4.8 and 50 K. We will report the results of these tests, showing that they were limited by the joint resistance and the apparent resistance across the coil, which increased dramatically after the tests at high field.

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