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First Test of a HTS Demonstrator Coil in the 11 T Background Field of the SULTAN Facility

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In the framework of the EuCARD-2 WP-10 program, CERN has produced two sets of High Temperature Superconductor (HTS) insert-magnets wound with ReBCO-Roebel cable, named FeaTHeR-M2 and FeaTHeR-M0. FeaTHeR-M2 is an aligned block magnet designed to generate 5 T in a 40 mm aperture, whereas FeaTHeR-M0 are sub-scale planar racetrack coils designed to test fabrication techniques and gain experience in quench detection and protection.
The SULTAN facility has been recently upgraded in order to test the FeaTHeR-M0 coils at variable temperature. An insert cryostat has been constructed and successfully commissioned in SULTAN, enabling the test of samples in helium gas at temperatures between 4.8 and 50 K. The cryostat is equipped with HTS current feedthroughs, which can provide 9.5 kA at 50 K to the sample while minimizing the heat leak to the Nb-Ti transformer of SULTAN.
The first of these CERN HTS demonstrator coils, FeaTHeR-M0.4, has been tested in SULTAN with a background field of 10.9 T. The tests were limited by the apparent resistance across the coil, which increased dramatically after the tests at high field.
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