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C3Po1B-05 [12]: Cryogenic Testing of Fast Ramping Superconducting Magnets for the SIS100 Synchrotron

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The international Facility for Antiproton and Ion Research FAIR is currently under construction at GSI, in Darmstadt, Germany. The core component of FAIR, the superconducting SIS100 synchrotron with a will operate with a high repetition rate of up to 1 Hz. The SIS100 ring with a circumference of 1083 m contains 108 main dipole magnets with a maximal field of 1.9 T. The ion-optical lattice of SIS100 contains also 166 main quadrupoles and 137 corrector magnets. The quadrupole and corrector magnets are assembled in the quadrupole units which are pair-wise integrated in the quadrupole doublet modules. All superconducting magnets will be tested at helium temperature to assure their compliancy with the specification. The main dipole modules are being tested at the magnet test facility at GSI. Cold testing of the quadrupole doublet modules is split in the testing of the quadrupole units at JINR, Russia and in testing of fully assembled quadrupole doublet modules at INFN, Italy. The cold testing program includes dynamic AC loss measurements and hydraulic adjustment of the parallel cooling channels of SIS100 next to the training, magnetic field measurements and other tests. We present the scope of cold testing of different types of magnet modules as well as the test results.

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