

Critical aspects in the development of a curved fast ramped superconducting dipole for FAIR SIS300 synchrotron.

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One of the most challenging components of the FAIR facility, under development at GSI, is the synchrotron SIS300 (300 Tm rigidity). In order to reach the required high intensities of proton and heavy ions beams, the magnets of this synchrotron have to be pulsed from the injection magnetic field of 1.5 T up to 4.5 T maximum field at the rate of 1 T/s. These 7.8 m long, cos-teta shaped coils with a 100 mm bore have the particular characteristic to be curved (the sagitta is 114 mm). Design activities, coupled with conductor R&D and model coil construction, are under way for developing a curved fast-cycled superconducting dipole, suitable for operations of the SIS300. The main goal is the construction, before the end of 2009, of a prototype magnet, including cold mass, fully integrated into a horizontal cryostat. An important intermediate milestone is the industrial feasibility assessment of the winding technology developed for a curve cos-theta dipole, through the construction of cured curved magnet poles, actually under way. The presentations will cover the critical aspects of this development, with particular emphasis on the constructive problems.