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Fast Cycling Superconducting Quadrupole

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FAIR (Facility for Antiproton and Ion Research), planned to be built at the site of GSI, will include the 300 Tm fast-ramping heavy ion synchrotron SIS300. In the frame of collaboration in FAIR project IHEP has developed, produced and tested two prototypes of a SIS300 fast cycling superconducting quadrupole. The main parameters of the quadrupole are: 45 T/m central gradient, the gradient ramp rate of 10 T/m/s, the superconducting coil inner diameter of 125 mm, 1 m length of the magnet. These prototypes had one layer coil which was wound by a cored cable with 19 wires. The superconducting wire of the second prototype had improved characteristics which have allowed to reduce the AS losses in the magnet. The paper presents measured characteristics of the quadrupole prototypes.

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