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A 8T Focusing Superconducting Solenoid for FRIB

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This paper presents a 8T solenoid used to focus and steer the heavy ion beams of the Facility for Rare Isotope driver linac at Michigan State University. It includes a main focusing solenoid, two bucking coils, two pair of horizontal and vertical correctors. The magnet is assembled with an entire length of 516 mm, including the helium vessel, ICR vacuum flanges and also the VCR for the helium supply port. Linear and nonlinear optimization method was used for the calculation of the magnetic field to meet the requirement of integrated squared field strengths and stray field with minimized superconducting wires. The corrector dipoles are placed between the bucking coils and the main solenoid. The helium vessel structural analysis, fabrication and test results are presented in this paper.

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