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Design, fabrication, and magnetic measurement of a prototype pulsed septum magnet for the Korea-4GSR project

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We have designed three types of septa—thin septum, thick septum, and DC septum—for the Korea-4GSR project, a 4 GeV diffraction-limited storage ring incorporating a 200 MeV LINAC and booster synchrotron. The thin septum is an in-vacuum pulsed septum magnet, the thick septum is an out-vacuum pulsed septum magnet, and the DC septum is an out-vacuum DC magnet. This presentation focuses specifically on the prototype design, fabrication, and measurement of the thick septum. The thick septum is designed with a maximum length of 1.25 m, a peak magnetic field strength of 0.56 T, and a minimum orbit distance of 18.6 mm. For prototyping, the length was reduced to 0.6 m while maintaining the same magnetic field strength and orbit distance, enabling the evaluation of manufacturability and magnetic field measurement techniques. We present the results of the design, fabrication, and magnetic field measurements of the prototype thick septum.

Footnotes

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