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Superconducting septa and fast ramped cosine-theta magnets

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Abstract title

The heavy ion synchrotron SIS300 of the FAIR project requires fast-ramped $\cos \theta$ superconducting magnets. The main dipole, quadrupole, and corrector magnets are being developed in frameworks of international collaborations. One of the key components of the SIS300 is the extraction septum magnet. It induces 3.65 T over the effective length of 4 m, contrary to the thin-wall-separated circulating beam region, where ideally no magnetic stray field shall occur. Due to severe constraints, such as space limitation in the tunnel, the design of the extraction septum magnet is based on a curved, truncated iron-yoked $\cos \theta$ magnet. We shortly present the SIS300 superconducting magnets and describe the conceptual design of the extraction septum magnet. General design options for high field septa based on the truncated iron-yoked cosine-theta concept will be discussed as well.

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