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Advanced design study of superconducting septum magnet for FCC

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A novel high field septum magnet with truncated cosine theta concept is a key component of FCC. Due to extreme high beam rigidity of FCC, an adequate high field superconducting septum magnet is required to construct the extraction beam line with a reasonable length. By utilizing NbTi technology, a cross section and mechanical design concept for the coil-end of a 4 T septum magnet was presented at FCC Week 2018. It was proved that the concept is very promising. We present our advanced design work such as studies on manufacturing sensitivity to magnetic field quality as well as the 3-dimensional modeling and the magnetic-field evaluation.

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