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## Concept Design Study of a Conductor Test Facility Magnet over 16T

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A conceptual design study of superconducting toroidal field (TF) magnet for a steady-state Korean fusion demonstration reactor (K-DEMO) was done in 2015. Through some minor design modifications of the K-DEMO TF magnet, the maximum toroidal field strength of the K-DEMO is expected to be about 16 T. In order to test a Cable-In-Conduit Conductor (CICC) of the K-DEMO TF magnet, a conductor test facility which can provide over 16 T magnetic field is required. Those test facility magnets, so called PUMA (Pulsed MAGnet) and SUCCEX (SUperconducting Conductor EXperiment), have been already reported on our previous conceptual design papers. However PUMA has only 12 T maximum field and SUCCEX is specialized on a U-shaped conductor samples and has short high field zone for SULTAN (SUpraLeiter TestANlage)-like straight samples. AS an alternative design for over 16 T conductor test facility magnet, racetrack dipole magnet design is proposed in this work. A specification of winding pack and magnetic field design which can offer the EDIPO(European DIPole)-like high field zone are considered. In addition, possible upgrade of magnet with high temperature superconductor (HTS) insert is also considered in design of magnet bore.

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