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Magnet development for FCC detectors

As part of the Future Circular Collider conceptual design study for hadron-hadron physics (FCC-hh), conceptual designs of detector magnets are being developed that provide sufficiently large bending power to study the particle products resulting from the 100 TeV collisions.
This talk focuses on several topics. Firstly, an overview is given of the various previously considered baseline designs to illustrate the design choices that led to the current baseline design. Secondly, the current baseline design, which features a larger superconducting central solenoid and two smaller superconducting forward solenoids, is discussed in terms of magnetic field properties, cold mass, cryostats and support structure, cooling, quench protection, etcetera. Thirdly, potential alternative detector magnet designs are discussed such as a dipole alternative for the forward solenoids and an ultra-thin superconducting central solenoid, where particle products traverse through the detector magnet before interacting with the calorimeters.
As the magnetic field and space requirements of the trackers, calorimeters, and muon chambers drive the design of the detector magnets, and the overall performance of the detector is in part dependent on the detector magnet performance, the conceptual detector magnet design of is an important component of the FCC-hh detector study.

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