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Mon-Mo-Po1.04-10 [42]: Design of an 18 T arc dipole for an LHC energy doubler

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We report the design for a hybrid block-coil dipole using advanced cable-in-conduit windings. The dipole is designed for use in the arcs of an energy-doubling lattice in the LHC tunnel.
The block coil design facilitates configuration of hybrid sub-windings of Bi-2212, Nb3Sn, and NbTi, each operating to the same fraction of critical current.
The cryogenics utilizes supercritical helium, operating in the window 4.5-5.5 K.
A novel method is provided for the support structure that provides robust support and stress management, and provides for the three sub-windings to be separately wound and heat-treated and then assembled and preloaded to complete the dipole.

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