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Fri-Mo-Po.05-13: Mechanical design of D1/D3 dipole magnets for the Electron-Ion Collider (EIC)

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The Electron-Ion Collider (EIC) at Brookhaven National Laboratory (BNL) is designed to deliver a peak luminosity of $10^{34} \text{ cm}^{-2} \text{ sec}^{-1}$. An electron storage ring (ESR) will be installed in the existing Relativistic Heavy Ion Collider (RHIC) tunnel and will store polarized electron beams from 5 to 18 GeV. The ESR will have 750 dipole magnets with varying field requirements, including 576 super-bend triplets consisting of two magnets D1/D3 and D2. This paper presents on the mechanical design of the D1/D3 dipole magnets within the arcs. The magnet includes a coil design that allows the magnet to be configured for variable ampere-turns per energy.

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