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Test magnet for the EIC Rapid Cycling Synchrotron

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Brookhaven National Laboratory (BNL) was recently chosen to host the Electron Ion Collider (EIC), which will collide high energy and highly polarized hadron and electron beams with a center of mass energy up to 140 GeV and a luminosity of up to $1e+34$ $1/cm^2/s$. Part of the accelerator complex is a Rapid Cycling Synchrotron (RCS), which is planned to accelerate electrons from 400 MeV to 18 GeV.

Due to the large energy range and the given circumference of the ring, the magnetic fields of the RCS magnets at injection are very low (\sim mT). A test dipole magnet was constructed to study differences in field quality from 5-50 mT. The paper discusses the design of the test magnet and first measurement results.

Footnotes

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Primary author: WITTE, Holger (Brookhaven National Laboratory)

Co-authors: MAHLER, George (Brookhaven National Laboratory); AVRONSART, Julien (Brookhaven National Laboratory); JOSHI, Piyush (Brookhaven National Laboratory); NOTARO, Sara (Brookhaven National Laboratory); Dr RANJBAR, Vahid (Brookhaven National Laboratory (BNL)); TEOTIA, Vikas (Brookhaven National Laboratory)

Presenter: WITTE, Holger (Brookhaven National Laboratory)

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