MT29 Abstracts and Technical Program



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Wed-Af-Po.02-03: EIC Detector Solenoid (MARCO) Design Update and Sample Conductor Testing

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The MARCO magnet is a 2T superconducting solenoid magnet central to the Electron Ion collider (EIC) detector at Brookhaven National Laboratory (BNL). The magnet utilizes a Rutherford cable in channel conductor with a nominal current of approximately 4 kA at 4.5 K. The cable and the copper stabilizer design was refined to aide fabrication of a 50 m long sample conductor. The characteristic of the conductor was revised to reflect the new design and the sample conductor was further systematically tested to confirm the same. The performance and safety margin of the magnet with the new conductor configuration was re-established. The return flux layout around the magnet was updated to reflect the change to the Rapid Cycling Synchrotron (RCS) beamline. The return flux steel configuration was optimized using OPERA to reduce the stray field at specified locations. The overall weight of the detector was reduced in the process which helps with the weight restrictions at the experimental hall.

Index Terms -detector magnet, Rutherford cable, superconductor, NbTi, OPERA

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Authors: Dr GHOSHAL, Probir (Thomas Jefferson National Accelerator Facility); Mr GOPINATH, Sandesh (Thomas Jefferson National Accelerator Facility); Dr RAJPUT-GHOSHAL, Renuka (Thomas Jefferson National Accelerator Facility)

Co-authors: Mr BERRIAUD, Christophe (CEA Saclay); Mr SIMON, Damein (CEA Saclay); Mr YOUNG, Daniel (Thomas Jefferson National Accelerator Facility); Dr SUN, Eric (Thomas Jefferson National Accelerator Facility); Mr STACCHI, Francesco (CEA Saclay); Mr JUSTER, Francois-Paul (CEA Saclay); Mr REYMOND, Hugo (CEA Saclay); Mr LOTTIN, Jean-Pierre (CEA Saclay); Mr SEGRETI, Michel (CEA Saclay); Dr CALVELLI, Valerio (CEA Saclay)

Presenter: Mr GOPINATH, Sandesh (Thomas Jefferson National Accelerator Facility)

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