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1 K refrigerator for the CLAS12 Polarized Target: Design, Construction, and First Results

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A dynamically polarized target of protons and deuterons in irradiated NH_3 and ND_3 will be employed with the CLAS12 detector system to explore the spin structure of the nucleon in Hall B at Jefferson Lab. This target will feature a versatile horizontal 1 K refrigerator that has been constructed by a collaboration composed of Christopher Newport University, Old Dominion University, the University of Virginia, and the JLab Target Group. A description of the challenges involved with designing the target for the CLAS12 experiments and the collaboration's solutions to them will be presented. These include a modular and compact design of the 1 K refrigerator and its ancillary equipment, as well as a novel mechanism for loading the target samples. Initial test results of the system will also be included.

Summary

Primary author: Mr BROCK, James (Thomas Jefferson National Accelerator Facility)

Presenter: Mr BROCK, James (Thomas Jefferson National Accelerator Facility)

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