

Abstract Submitted
for the DNP11 Meeting of
The American Physical Society

Characterization of a 1/2-scale prototype magnet at cryogenic temperatures for the SNS nEDM experiment¹ ADRIAN PEREZ GALVAN, BRADLEY FILIPPONE, California Institute of Technology, NEDM COLLABORATION — The observation of a permanent electric dipole moment of the neutron at the current level of experimental sensitivity would indicate new physics beyond the Standard Model of particle interactions. In addition, it might also explain the mystery behind the matter-antimatter asymmetry of the Universe. Given these tantalizing implications, a new multi-institutional effort to measure the neutron electric dipole moment (nEDM) using ultra-cold neutrons and polarized ^3He in a bath of superfluid ^4He is currently underway at the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory. The search for the nEDM asks for stringent requirements on the uniformity of the magnetic environment at cryogenic temperatures. We present measurements of the uniformity of a half-scale version of the coil that will be used for the experiment. The measurements are performed while the coil is at a temperature of ≈ 90 K. The results are in good agreement with previous room temperature measurements which suggest that magnetic non-uniformities due to thermal contraction are under control.

¹Supported by NSF and DOE.

Adrian Perez Galvan
California Institute of Technology

Date submitted: 27 Jun 2011

Electronic form version 1.4