

Abstract Submitted
for the SES08 Meeting of
The American Physical Society

Cryogenic Engineering for the Neutron Electric Dipole Measurement at the Spallation Neutron Source¹ D.G. HAASE, P.R. HUFFMAN, NC State University, J. BOISSEVAIN, Caltech, E.I. IHLOFF, C. VIDAL, MIT — A planned experiment at the SNS at ORNL will increase the precision of present limits on the electric dipole moment of the neutron by almost two orders of magnitude. Neutrons from the Fundamental Neutron Physics Beamline will enter a container of liquid helium at 0.45 K and become trapped by losing their kinetic energy in collisions with phonons in the superfluid helium. The experiment requires a large insulated cryovessel, several containers of liquid helium including a 1000 l chamber, a high cooling power dilution refrigerator and a dedicated helium liquefier/refrigerator. The final design must include limited use of magnetic, conducting and neutron activated materials. The time for cooling and warming the cryovessel must be minimized to facilitate the testing process. We will describe the design of this system, and an analysis of the heat flows and experimental constraints of this large cryogenic experiment.

¹Work supported by the US DOE and LANL.

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Date submitted: 15 Aug 2008

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