Abstract Submitted
for the DNP16 Meeting of
The American Physical Society

Magnetic field component demonstration for a neutron electric dipole moment search SIMON SLUTSKY, California Institute of Technology — A neutron electric dipole moment (EDM) search at the Oak Ridge National Laboratory's Spallation Neutron Source (SNS) will probe with a sensitivity of $< 5 \times 10^{-28}$ e-cm. Trapped, polarized ultracold neutrons will precess in a constant magnetic field and variable electric field, and a non-zero neutron EDM will appear as a variation in the precession frequency correlated with the electric field. Magnetic field gradients must be kept below 10 pT/cm to mitigate false EDMs produced by the geometric phase effect and to maximize the neutron spin-relaxation lifetime. I will discuss a prototype magnetic shielding system, including a nearly-hermetic superconducting lead shield, built to demonstrate the required gradients at $\sim$1/3-scale of the final experiment. Additionally, the system will evaluate the eddy current heating due to RF fields produced by a proposed neutron-"spin-dressing" technique.

Simon Slutsky
California Institute of Technology

Date submitted: 01 Jul 2016 Electronic form version 1.4