

Abstract Submitted
for the DNP15 Meeting of
The American Physical Society

Upgrades to the ultracold neutron source at the Los Alamos Neutron Science Center ROBERT PATTIE, Los Alamos National Laboratory, LANL-NEDM COLLABORATION — The spallation-driven solid deuterium-based ultracold neutron (UCN) source at the Los Alamos Neutron Science Center (LANSCE) has provided a facility for precision measurements of fundamental symmetries via the decay observables from neutron beta decay for nearly a decade. In preparation for a new room temperature neutron electric dipole moment (nEDM) experiment and to increase the statistical sensitivity of all experiments using the source an effort to increase the UCN output is underway. The ultimate goal is to provide a density of 100 UCN/cc or greater in the nEDM storage cell. This upgrade includes redesign of the cold neutron moderator and UCN converter geometries, improved coupling and coating of the UCN transport system through the biological shielding, optimization of beam timing structure, and increase of the proton beam current. We will present the results of the MCNP and UCN transport simulations that led to the new design, which will be installed spring 2016, and UCN guide tests performed at LANSCE and the Institut Laue-Langevin to study the UCN transport properties of a new nickel-based guide coating.

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Date submitted: 01 Jul 2015

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