

Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Minimising the Residual Field and Field Gradient in a Magnetically Shielded Room for an nEDM experiment at Los Alamos National Laboratory¹ CHAMINDU AMARASINGHE, Valparaiso University, LANL NEDM COLLABORATION — The LANL neutron Electric Dipole Moment (nEDM) experiment is an effort to set a sensitivity limit of $3.2 \times 10^{-27} e \text{ cm}$ on the electric dipole moment of the neutron, an order of magnitude smaller than the current upper limit. This measurement uses Ramsey's method of oscillating magnetic fields. The magnetic field and field gradient have to be low enough to avoid the smearing of the Ramsey fringes and to increase the neutron dephasing time respectively. The experiment is enclosed in a two layer Mu-metal magnetically shielded room (MSR) to null any external magnetic fields from the environment. The MSR is degaussed to sufficiently reduce its residual magnetic field and field gradient. The MSR is designed for residual fields as low as 30 nT. The experiment further requires a field gradient of 1 nT/m or smaller. Here we report on the degaussing procedure and the resulting improvement in the shielding prowess of the MSR.

¹Funded by an NSF Grant

Chamindu Amarasinghe
Valparaiso University

Date submitted: 31 Jul 2017

Electronic form version 1.4