

Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Fitting strategies for the SNS nEDM experiment in the presence of time-varying magnetic fields¹ MOJTABA BEHZADIPOUR, University of Kentucky, SNS NEDM COLLABORATION — The Spallation Neutron Source (SNS) neutron electric dipole moment experiment (nEDM) performs a Larmor spin precession technique on ultracold neutrons and ³He. The spin-dependent interaction of the ultracold neutrons and polarized ³He co-magnetometer atoms will produce sinusoidal oscillations in the scintillation light that is sensitive to the difference in the neutrons' and ³He atoms' precession frequencies, f_{3n} . If the neutron EDM is non-zero, the value of f_{3n} will shift upon reversal of the relative directions of the magnetic and electric fields. The precession frequency of the ³He will be measured via detection of the precessing ³He magnetization in SQUID pickup loops. We carried out simulations of the SQUID and scintillation rate signals in the presence of time-varying magnetic fields and then performed a global fit by minimizing the χ^2 made up of the two signals. We present different fitting strategies for a global fit to the scintillation light and the ³He co-magnetometer signal in the presence of time-varying magnetic fields.

¹This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, under Award Number DE-SC0014622.

Mojtaba Behzadipour
University of Kentucky

Date submitted: 30 Jun 2020

Electronic form version 1.4