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Magnetic field uniformity for the nEDM experiment SIMON SLUTSKY, California Institute of Technology, NEDM COLLABORATION — The nEDM experiment at the Spallation Neutron Source (SNS) will search for a neutron electric dipole moment (EDM) with a sensitivity of $<5*10^{-28}$ e-cm. Neutrons will precess in a constant magnetic field and variable electric field, and non-zero neutron EDM will appear as a variation in the precession frequency correlated with the changing electric field. Geometric phase and neutron polarization lifetime effects constrain the allowed magnetic field gradient to below 0.1 uG/cm. Gradients nearly satisfying this requirement have been achieved using a $\cos(\theta)$ coil inside an open-ended superconducting lead shield operated at cryogenic temperatures and using the design electric fields. I will describe efforts to further improve the magnet design using a superconducting endcap.

Simon Slutsky
California Institute of Technology

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