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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 $< 5 \cdot 10^{-28}$ 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. Gradients in the magnetic field lead to spurious EDM signals through a geometric phase effect. The volume averaged magnetic gradient must be below 0.1 μG/cm to reach the desired sensitivity. In this talk, we describe an effort to produce such a uniform magnetic field in a laboratory using a $\cos(\theta)$ coil operated at cryogenic temperatures inside a superconducting lead shield.

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