

Abstract Submitted  
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**Magnetic Field Monitoring in the SNS Neutron EDM Experiment**<sup>1</sup> ALINA ALEKSANDROVA, University of Kentucky, SNS NEDM COLLABORATION — One of the most sensitive probes of charge-conjugation and parity (CP) violation is the neutron electric dipole moment, for which the current upper limit is  $d_n < 3.0 \times 10^{-26}$  e-cm (90% CL). The Spallation Neutron Source neutron EDM experiment aims to reduce this limit by two orders of magnitude. Targeting a sensitivity of  $10^{-28}$  e-cm, it is important to suppress systematic effects in the experiment caused by magnetic field nonuniformities. Thus, it is important to be able to precisely control and monitor the magnetic field gradients inside of the experimental volume. However, it is not always possible to measure the field within the region of interest directly. To remedy this issue in the SNS nEDM experiment, we have designed a field monitoring system that will allow us to reconstruct the field gradients inside of the fiducial volume using noninvasive measurements of the field components at discrete locations external to this volume. The field monitor array consists of 39 cryogenic-compatible, single-axis fluxgate magnetometer probes that are controlled by an automated switching system. This talk will present the design and studies of this field monitor along with studies performed to characterize the properties of these sensors at cryogenic temperatures.

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