

Abstract Submitted  
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**Behavioral Study of Magnetization of Super-mirror Sample<sup>1</sup>**

GRETCHEN PHELPS, MUKUT KALITA, WOLFGANG KORSCH — The surface magneto-optic Kerr effect (SMOKE) refers to the phenomenon in which the polarization of light reflected from a magnetized surface is rotated, the magnitude of which is proportional to the magnetization of the surface. Using SMOKE we are able to extract the Kerr rotation  $\theta_K$  and Kerr ellipticity  $\epsilon_K$  of an FeCoV/TiN super-mirror, and non-magnetic samples. A comparison between these results is utilized to study the temporal behavior of the magnetization of the super-mirror sample. Our set-up incorporates a modulation technique, which allows for phase sensitive detection through lock-in amplifiers. Currently our sensitivity is at the  $\mu\text{rad}$  level. This study is part of the Oak Ridge National Lab nEDM Collaboration which plans to improve the present limit on the permanent electric dipole moment of the neutron by up to two orders of magnitude. The experiment will utilize magnetic super-mirrors to both polarize and guide neutrons. Preliminary analysis comparing results obtained from a magnetized super-mirror and non-magnetic samples will be presented.

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