

Abstract Submitted  
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**An experimental search for the electron Electric Dipole Moment in Gadolinium Gallium Garnet** YOUNG JIN KIM, CHEN-YU LIU, Indiana University, Bloomington — A discovery of a permanent electric dipole moment of the electron (eEDM) would provide crucial information about the nature of T-violation and imply new sources of CP-violation beyond the Standard Model. While the leading experimental technique used to measure EDM is based on the nuclear magnetic resonance, we are pursuing research that would improve the present experimental limit of the eEDM using a new technique in solid-state systems at low temperatures. The experiment uses a paramagnetic insulator Gadolinium Gallium Garnet with a large magnetic response. The presence of the eEDM leads to a finite magnetization when the garnet sample is subjected to a strong electric field. The resulting magnetization can be measured using the Superconducting Quantum Interference Device (SQUID) as a sensitive magnetometer. In this talk, we will discuss the progress to control the systematic effects and improve the sensitivity. The major efforts include the design and implementation of a 24-bit data acquisition system with ultra-low level of channel crosstalk, and the control of the high voltage drift from the supply. With these considerable progresses, we report our first background-free experimental limit of the eEDM on the order of  $10^{-24}$  e.cm .

Young Jin Kim  
Indiana University, Bloomington

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