Abstract Submitted
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Study of Charge Build Up in UCN Storage Cell[1] MARK BROERING, JOSH ABNEY, Univ of Kentucky, CHRISTOPHER SWANK, BRADLEY FILIPPONE, California Institute of Technology, WEIJUN YAO, Oak Ridge National Lab, WOLFGANG KORSCH, University of Kentucky — The neutron EDM collaboration at the Spallation Neutron Source(ORNL) is using ultra-cold neutrons in superfluid helium to improve the nEDM limit by about two orders of magnitude. These neutrons will be stored in target cells located in a strong, stable electric field. Local radiation will generate charged particles which may build up on the target cell walls reducing field strength over time. The field changes need to be kept below 1%, making it necessary to study this cell charging behavior, determine its effect on the experiment and find ways to mitigate this. In order to study this cell charging effect, a compact test setup was designed. Using this scaled down model, charged particles are generated by a ^{137}Cs source and the electric field is monitored via the electo-optic Kerr effect. Liquid nitrogen has a much stronger response to electric fields than helium, making it an ideal candidate for first tests. Cell charging effects have been observed in liquid nitrogen. These results along with the experimental technique and progress toward a superfluid helium measurement will also be presented. This research is supported by DOE grants: DE-FG02-99ER41101, DE-AC05-00OR22725

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