

Abstract Submitted
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Measurement cells of the Spallation Neutron Source neutron Electric Dipole Moment experiment¹ KENT LEUNG, North Carolina State University, SNS NEDM COLLABORATION — The Spallation Neutron Source (SNS) neutron Electric Dipole Moment (nEDM) experiment will use 3 L rectangular measurement cells filled with superfluid helium at 0.3 - 0.5 K with a $\sim 10^{-10}$ fraction of polarized ^3He . These cells are made from 0.5 in thick PMMA plates, coated with a mixture of deuterated polystyrene and deuterated tetraphenyl butadiene and then glued together with deuterated acrylic cement. The experiment requires the cells to be: non-magnetic, non-conducting, fluorescent at the inner surface for VUV photons, optically transparent, cryogenic-friendly, polarized ^3He friendly, and have long ultracold neutron (UCN) storage times. The successful production of full-sized cells and how these cells address each of the above requirements, will be presented. Focus will be given on recent UCN storage tests of several cells measured between 90 K to 20 K. These results demonstrate the cryogenic robustness of these cells and UCN loss f -factors of $\sim 2 \times 10^{-5}$, better than beryllium at low temperatures. A previous problem of gaps or uncovered patches exposed on the inside of the cell has been resolved. Exploratory work on new polymer coatings that could improve our cells further will also be presented.

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