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Neutron storage time measurement for the neutron EDM experiment W. CLARK GRIFFITH, TAKEYASU ITO, JOHN RAMSEY, MARK MAKELA, STEVEN CLAYTON, RAUL HENNINGS-YEOMANS, M. SAIDUR RAHAMAN, SCOTT CURRIE, TODD WOMACK, WALTER SONDHEIM, MARTIN COOPER, Los Alamos National Laboratory, NEDM COLLABORATION — A new experiment to search for the neutron electric dipole moment (nEDM) is under development for installation at the Spallation Neutron Source (SNS) at Oakridge National Laboratory. The experiment will use ultra-cold neutrons (UCN) stored in superfluid helium, along with ^{3}He atoms acting as a neutron spin analyzer and comagnetometer. One crucial factor affecting the ultimate sensitivity of the experiment is the neutron storage time that can be obtained in the acrylic measurement cell. The acrylic cell walls will be coated with deuterated polystyrene (dPS), which is expected to give a wall loss factor of $\sim< 10^{-5}$ per bounce when cooled below the point where upscattering by hydrogen impurities contribute to UCN losses. We are currently preparing a measurement at Los Alamos to verify that a 10^{-5} wall loss factor can be achieved in a dPS coated acrylic test cell. The planned measurement will investigate the temperature dependence of the UCN storage time in the dPS coated test cell between room temperature and below 20 K.

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