

Abstract Submitted
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^3He Relaxation Time Measurements at $\sim 400\text{mK}$ for the neutron electric dipole moment (nEDM) experiment¹ QIANG YE, Duke University, NEUTRON EDM TEAM — In the new neutron electric dipole moment (nEDM) experiment planned to be carried out at the SNS, the neutron storage cell will be made of dTPB-dPS (wavelength shifting material) coated acrylic and filled with superfluid ^4He at $\sim 400\text{mK}$. The experiment will use the nuclear magnetic resonance technique to measure the neutron precession frequency by comparing with that of the polarized ^3He using the spin-dependent nuclear process: $\vec{n} + ^3\vec{H}e \rightarrow p + t + 764\text{ keV}$. The polarized ^3He will also be used as a co-magnetometer to monitor *in situ* the magnetic field during the experiment. Understanding the relaxation mechanism of polarized ^3He in the storage cell under the experimental conditions and maintaining the ^3He polarization is crucial. Following our earlier study[1] of the ^3He relaxation time in a dTPB-dPS coated cylindrical acrylic cell at a temperature of 1.9K in the presence of superfluid ^4He with a magnetic holding field of 21 G, more measurements at $\sim 400\text{mK}$ have been carried out in cylindrical and rectangular acrylic cells using a dilution refrigerator at TUNL with the magnetic holding field of $\sim 7\text{ G}$. Preliminary results will be presented. [1] Q. Ye *et al.* Physical Review A, 77:053408, 2008

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