

Abstract Submitted
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Suppression of Ultracold Neutron Depolarization on Material Surfaces with Magnetic Holding Fields RAYMOND RIOS, Los Alamos National Lab — Experiments involving polarized Ultracold Neutrons (UCN) for high precision measurements require the use of high Fermi potential materials with a low spin flip probability per bounce. Previous studies show that the spin flip probability for materials vary on the order of 10^{-3} to 10^{-6} . In this study, the depolarization of UCN was measured within 1-m long, 2 3/4" diameter bare copper, electropolished copper, diamond-like carbon-coated copper, and stainless steel guide tubes as a function of the magnetic holding field. The UCN were trapped between a 6 Tesla solenoidal magnet and a copper plate. A series of Helmholtz coils produced a magnetic holding field over the length of the test guide at 10, 100, or 250 Gauss. The surface depolarization was observed to be suppressed at higher holding fields. These measurements will aid in the determination of an upper limit on depolarization of UCN in the UCNA beta asymmetry measurement at LANL and in understanding the mechanisms for depolarization in non-magnetic guides.

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