

Abstract Submitted
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Uncertainty and Systematic Corrections for the Neutron Polarization in the UCNA Experiment ERIC DEES, North Carolina State Univ, UCNA COLLABORATION — The UCNA experiment uses the decay of polarized ultracold neutrons (UCN) to measure the angular correlation A between the emitted electron's momentum and the initial polarization direction of the neutrons magnetic moment. As such, a precise determination of the average spin polarization of the neutron's population in the decay trap is required. By implementing a neutron reflecting shutter at the entrance of the decay trap, the residual UCN outside of the decay trap can be drained, thus dramatically increasing the signal to background ratio in the subsequent measurement of the depolarized fraction. However, our implementation of the shutter also involves a systematic correction associated with the evolution of the polarized and depolarized populations whilst trapped during this background draining phase. Our estimates of this correction come from Monte Carlo simulations of the neutron transport, constrained by direct measurements of the depolarization evolution by the shutter and direct measurements of the efficiency of our polarimetry technique. Current estimates of the uncertainty in determination of the polarization, the agreement between measured and simulated observables, along with predictions of the systematic evolution correction will be discussed.

Eric Dees
North Carolina State Univ

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