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Precision UCN Polarimetry and the UCNA Experiment A.T. HOLLEY, FOR THE UCNA COLLABORATION — The goal of the UCNA experiment is to determine the angular correlation between the electron momentum and the neutron spin (the beta-asymmetry) in free neutron decay using polarized ultracold neutrons (UCN). The experimental strategy is to transport UCN into a decay volume through a 7T static magnetic field, allowing the magnetic potential to polarize the UCN. The neutron polarization can then be reversed via an rf adiabatic spin flipper which sits between the 7T polarizing field and the decay volume. This spin flipper also allows an *in situ* measurement of the depolarized contamination that develops during a constant-polarization measurement cycle. Since the neutron polarization multiplies the beta-asymmetry in the expression for the polarized neutron decay rate, precision measurements of the beta-asymmetry require at least a commensurate precision in the UCN polarization. Details of the polarimetry techniques utilized for UCNA and the limits they place on the spin contamination present in the experiment will be discussed and compared to expectations from Monte Carlo transport models. Plans to enhance the sensitivity of our polarimetry measurements will also be discussed in relation to the goal of measuring the beta-asymmetry to better than 0.5%.

Adam Holley
North Carolina State University

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