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Determining the polarization of ^{3}He by means of an optical technique TIMOTHY NICHOLS, Hendrix College — An experiment now being developed will increase the accuracy of the current neutron electric dipole moment (EDM) measurement by a factor of 100. In order to obtain this new level of accuracy, a system of polarized ultra-cold neutrons (UCN) and ^{3}He is being used. The UCN's and ^{3}He are placed in a combined magnetic and electric field where their relative precession rate is measured using the spin-dependent n-^{3}He capture reaction. Any change in the precession rate when the electric field is reversed is attributable to an EDM. The polarization of the ^{3}He must be maintained at as high a level as possible, and a variety of materials are being tested to determine their wall depolarization probabilities. In order to understand the ultimate sensitivity of these measurements, the initial polarization of the ^{3}He, produced by optical pumping of a discharge, must be known. In this paper we present a measurement of the circular polarization of light from the 667 nm transition in He in a standard pumping cell. The polarization in this transition is induced by the nuclear polarization via the hyperfine interaction; the degree of polarization has been previously calibrated by comparing with absolute nuclear magnetic resonance measurements.

Timothy Nichols
Hendrix College

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