

Abstract Submitted
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Progress Towards the Detection of Faraday Rotation on Spin Polarized ^3He ¹ JOSHUA ABNEY, MARK BROERING, WOLFGANG KORSCH, University of Kentucky — Off-resonance Faraday rotation can offer a method to measure the nuclear spin optical rotation of the ^3He nucleus and gain access to new information about the atomic polarizability of the Helium atom. The interaction of the polarization state of light with the nuclear spin of the helium atom is very weak and has never been detected. A sensitive triple modulation technique has been developed which can detect the expected rotation angle on the order of 100 nrad. Once a Faraday rotation signal is observed, the next step is to separate the magnetic and electric contributions to the rotation by utilizing their different frequency dependencies. Recent studies involved optimizing several parameters which impact ^3He target polarization. Progress towards detecting nuclear spin optical rotation on ^3He will be reported.

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