

Abstract Submitted
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Progress Towards the Detection of Faraday Rotation on Spin Polarized ^3He ¹ JOSH ABNEY, MARK BROERING, WOLFGANG KORSCH, University of Kentucky — Off-resonance Faraday rotation can offer a new method to monitor the nuclear spin polarization of a dense ^3He target and gain access to new information about the magnetic polarizability of the ^3He nucleus. 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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Josh Abney
University of Kentucky

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