

Abstract Submitted
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Measuring the Spin-Dependent Scattering Length of ^3He using Neutron Interferometry M. HUBER, F.E. WIETFELDT, Tulane University, M. ARIF, T.R. GENTILE, W. CHEN, D. PUSHIN, L. LANG, NIST, T. BLACK, UNC Wilmington — Experimental measurements of neutron scattering lengths are only recently achieving the required accuracy to test nucleon-nucleon (N-N) models. Neutron Interferometry (NI) provides some of the most precise values of spin-independent neutron scattering lengths including percent or better measurements for n-H, n-D, and n- ^3He . For ^3He , the spin-dependent neutron scattering length, b_i , has been measured once before by Zimmer *et al.* [1] using a polarized ^3He target inside a spin echo apparatus. Their result $b_i = -2.365(20)$ differs from various theoretical models by more than 4σ . Currently, we are conducting an experiment to measure b_i for ^3He to better than half a percent at the NI and Optics Facility at the National Institute of Standards and Technology (NIST) using a small, flat-windowed gas cell containing polarized ^3He . This is the first use of a polarized gas target in a NI. Results from this experiment will be presented. This work is supported by the National Science Foundation and NIST.

[1] O. Zimmer *et al.* Journal EPJ direct, 4(1):1–28, 2002.

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