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Polarized ^{3}He Neutron Spin Filter for Parity-Odd Asymmetry Measurement on 0.88-eV p-Wave Resonance of ^{81}Br[1] CLAYTON AUTON, WILLIAM SNOW, JOHNATHAN CUROLE, HAO LU, BEN SHORT, Indiana University Bloomington, SEPPO PENTTILA, PETER JIANG, Oak Ridge National Laboratory, NOPTREX COLLABORATION — The Neutron OPtics Time Reversal Experiment (NOPTREX) collaboration plans to conduct a sensitive search for time reversal invariance violation in polarized neutron transmission through polarized nuclei by taking advantage of the very large amplification of symmetry-violating effects in p-wave resonances of certain heavy nuclei. As a step toward this experiment we are remeasuring parity violation in selected nuclei to greater precision at LANSCE. One such candidate is ^{81}Br with a longitudinal asymmetry of $A = 0.024 \pm 0.004$ at the 0.88-eV resonance. We aim to measure this asymmetry to 5% accuracy. This requires an intense source of polarized neutrons at eV energies. We plan to use a polarized ^{3}He neutron spin filter based on the very large spin dependent neutron absorption cross-section of neutrons on ^{3}He. In the ^{3}He system under construction at Indiana University, ^{3}He gas is polarized by spin-exchange optical pumping (SEOP). Key components include a μ-metal shielded solenoid and ^{3}He gas cell both generously provided by ORNL. This talk will describe the proposed ^{81}Br experiment, motivation for choice of ^{3}He SEOP for NOPTREX, and projected performance of the ^{3}He spin filter.

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Clayton Auton
Indiana University Bloomington

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