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A Polarized ^{3}He Neutron Spin Filter for $n+p \rightarrow d+\gamma$[1] TIM CHUPP, University of Michigan FOCUS Center, NPDGAMMA COLLABORATION — The $n + p \rightarrow d + \gamma$ experiment uses a pulsed cold neutron beam to measure A_γ, the parity-violating correlation of neutron spin and the direction of gamma–ray emission upon capture of polarized neutrons by protons. A large area polarized ^{3}He neutron spin filter has been constructed and used for measurements on the FP12 beam line at the Los Alamos Neutron Scattering Center. The spin–filter consists of roughly cylindrical cells 5 cm thick with 10–12.5 cm inside diameter, which covers most of the available neutron beam area. The cells, made at NIST, use boron free, alumino–silicate glass (GE-180) and are filled with about 1 atmosphere (at room temp.) of ^{3}He, natural rubidium and N_2. Two broadband, 30 W laser diode arrays coupled to optical fibers irradiate the cell and polarize rubidium vapor. Polarization is transferred to ^{3}He nuclei though spin-exchange collisions. The transmission of neutrons through the spin filter is used to measure the neutron polarization, and the ^{3}He polarization is extracted from the wavelength dependence. Continuous ^{3}He polarization greater than 50% ($\pm$ 2%) has been maintained over the course of several weeks. A ^{3}He analyzer cell, polarized off-line can be positioned down stream from the experiment to monitor neutron polarization and spin flipping. Cell construction, polarizer design, performance, and polarimetry will be described in this talk.

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Tim Chupp
University of Michigan FOCUS Center

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