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Determining the Neutron Polarization of the Fundamental Neutron Physics Beamline at the Spallation Neutron Source with a ^3He Spin Filter MATTHEW MUSGRAVE, University of Tennessee, NPDGAMMA COLLABORATION — The Fundamental Neutron Physics Beamline (FNPB) at the Spallation Neutron Source (SNS) provides a pulsed beam of polarized cold neutrons for several experiments including NPDGamma and n3He. The neutrons are polarized by a multi-channel super mirror polarizer. The polarization of the neutron beam was measured at several points across the beam cross section by utilizing the spin dependent capture cross section of the neutron on polarized ^3He . The neutron beam is incident on a series of ^6Li loaded collimators and a ^3He spin filter. The transmitted neutrons are detected in a ^3He monitor operating in current mode. An RF spin rotator reverses the spin of the neutrons on successive accelerator pulses enabling the transmission of different neutron spin states to be measured, and the ^3He spin is reversed by adiabatic fast passage to enable the transmission through different ^3He spin states. The neutron polarization can be determined in a redundant fashion using these two independent spin reversals.

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