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**Helium 3 neutron precision polarimetry** CHRISTOPHER MENARD,  
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Measuring neutron polarization to a high degree of precision is critical for the next  
generation of neutron decay correlation experiments. Polarized neutrons are also  
used in experiments to probe the hadronic weak interaction which contributes a  
small portion ( $\sim 10^{-7}$ ) of the force between nucleons. Using a beam of cold neu-  
trons at Los Alamos Neutron Science Center (LANSCE), we polarized neutrons and  
measured their absolute polarization to  $\sim 0.1\%$ . Neutrons were polarized by pass-  
ing them through a  $^3\text{He}$  spin filter, relying on the maximally spin dependent  $^3\text{He}$   
neutron absorption cross section. The neutron polarization can be determined by  
measuring the wavelength-dependent neutron transmission through the  $^3\text{He}$  cell. An  
independent measurement of the neutron polarization was also obtained by passing  
the polarized beam through an RF spin flipper and a second polarized  $^3\text{He}$  cell,  
used as an analyzer. To measure the efficiency of the spin flipper, the same mea-  
surements were made after reversing the  $^3\text{He}$  polarization in the polarizer by using  
NMR techniques (adiabatic fast passage). We will show the consistency of these  
two measurements and the resulting precision of neutron polarimetry using these  
techniques.

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