Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

Current mode wire chambers for cold neutron detection at the SNS FNPB MARK MCCREA, Univ. of Manitoba, NPDGAMMA COLLABORATION, N3HE COLLABORATION — A ^{3}He chamber is a multi-wire proportional counter for detecting neutrons. A ^{3}He nucleus that captures a neutron will break up by the reaction $n +^3 He \rightarrow p + T + 765\ keV$ which is detected by gas ionization inside the chamber caused, by the reaction products. The 765 keV is released as kinetic energy of the proton and triton, allowing a consistent signal from each capture. The chamber gas is a mixture of gases with a fraction of a ^3He, the amount of which is used to adjust the neutron thickness; the fraction of beam that is captured in the monitor. I will report on the design, construction, and testing of a new set of beam monitors for the Spallation Neutron Source Fundamental Neutron Physics Beam line (FNPB), which use this technology. The ^{3}He chambers will be used to monitor the neutron flux at various positions along the neutron beam, as it passes through cold neutron experiments planned at the SNS. In addition, I will report on the design of a ^{3}He wire chamber that will be used in the n^{3}He experiment at the SNS. This chamber uses the same neutron detection process as described above, but will be black to neutrons (high ^3He content) with a small amount of ionization gas, to allow the protons to range out over as long a distance as possible. This chamber will be used to measure the parity violating longitudinal asymmetry in the number of protons emitted in the capture reaction.

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Date submitted: 29 Jun 2009 Electronic form version 1.4