

Abstract Submitted
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³He multi-wire proportional counters for the FNPB at the SNS
MARK MCCREA, University of Manitoba, NPDGAMMA COLLABORATION,
N3HE COLLABORATION — We have constructed a set of beam monitors for
the Fundamental Neutron Physics Beam Line (FNPB), at the Spallation Neutron
Source, Oak Ridge National Laboratory. The beam monitors are ³He multi-wire
proportional counters. A ³He nucleus that captures a neutron will break up by the
reaction $n + {}^3\text{He} \rightarrow p + T + 765\text{keV}$. The 765keV is released as kinetic energy of
the proton and triton which will ionize the chamber gas, giving a consistent signal
from each capture. The chamber gas is a mix of N_2 and ³He at 750 Torr. The
³He fraction used determines the fraction of the beam that is captured. The ³He
chambers are used to monitor the neutron flux along the neutron beam, and are
currently used for the NPDGamma experiment, but will also be used for beam line
diagnostics in future experiments. I will report on the monitor design, construction,
and beam data obtained during the commissioning of the NPDGamma experiment.
I will also report on the design, and simulation of a ³He wire chamber to be used
in the n³He experiment, which runs after the NPDGamma experiment. It 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 to measure the parity violating
longitudinal asymmetry in the number of protons emitted in the capture reaction.

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