

Abstract Submitted
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Performance of Current-Mode Ion Chambers as Beam Monitors in a Pulsed Cold Neutron Beam for the NPDGamma experiment

R. CHAD GILLIS, Indiana University, NPDGAMMA COLLABORATION — The NPDGamma collaboration has built and commissioned an apparatus to measure the parity-violating gamma asymmetry A in the low energy np capture process $n + p \rightarrow d + \gamma$. The asymmetry in question is a 10^{-8} correlation between the spin of the incident (polarized) neutron and the outgoing 2.2 MeV gamma ray. A set of purpose-built, ^3He -filled ionization chambers read out in current mode is used to monitor the incident neutron flux, the beam polarization, and the transmission of the liquid para-hydrogen target during the NPDGamma measurements. As will be described in the talk, these beam monitors are simple, reliable, low-noise detectors that have performed excellently for NPDGamma. We have verified that the beam monitor signals can be interpreted to reproduce the known time-of-flight dependence of beam flux from the LANSCE pulsed cold neutron source, and that the neutron beam polarization can be measured at the 2% level from direct measurements of the transmission of the beam through the beam polarizer.

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