Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

The Orthohydrogen Fraction of the NPDGamma Liquid Hydrogen Target[1] CHAD GILLIS, Indiana University, NPDGAMMA COLLABORATION — The NPDGamma Experiment at the SNS is measuring the parity-violating correlation A_γ between neutron spin and gamma momentum in the reaction $\overrightarrow{n} + p \rightarrow d + \gamma$ with a projected statistically limited precision of a part per 10^8. In the experiment, a polarized cold neutron beam captures on a 16.5 liter cryogenic liquid parahydrogen target. Since orthohydrogen has a large neutron spin flip scattering cross section, with a part per 10^4 of orthohydrogen expected to produce a relative change in the beam polarization of close to a percent, it is essential for our experiment that the ortho fraction be kept low. An ortho-para conversion loop was incorporated into the target so that the ortho fraction would be held close to its thermodynamic equilibrium level of a few parts per 10^4, and it is important that deviations from thermodynamic equilibrium be well understood. Theoretical and empirical arguments for placing a limit on the orthohydrogen fraction of our liquid hydrogen target will be discussed.

[1]Supported in part by the National Science Foundation

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Date submitted: 01 Jul 2013 Electronic form version 1.4