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A Measurement of the Total Cross Section of Liquid Parahydrogen for Cold Neutrons KYLE GRAMMER, University of Tennessee, NPDGAMMA COLLABORATION — Liquid hydrogen is commonly used as a neutron moderator and accurate knowledge of the scattering cross section is critical for the design of cold sources. The total cross section for cold neutrons with wavelengths between 2.3 and 14Å has been measured for liquid hydrogen at 15.7K. Provided that the orthohydrogen concentration [2] in the target vessel is at the thermodynamic equilibrium limit and using the known hydrogen absorption cross section, we can extract the parahydrogen scattering cross section from our measurement. Our result does not agree with the Seiffert [1] measurement and this disagreement cannot be due to orthohydrogen contamination in our measurement. The measurement was performed on the Fundamental Neutron Physics Beamline at the Spallation Neutron Source at Oak Ridge National Laboratory. The experiment and data analysis will be described.

[1] W. D. Seiffert. Euratom Report No. EUR 4455d, 1970.
[2] See talk by R. C. Gillis. DNP October 2013.

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