Abstract Submitted
for the APR06 Meeting of
The American Physical Society

Indirect Determination of the GDH Integrand on the Deuteron near Photodisintegration Threshold M.A. BLACKSTON, M.A. AHMED, Duke University/TUNL, B.E. NORUM, Physics Department, University of Virginia, B. SAWATZKY, Temple University/JLAB, H.R. WELLER, Duke University/TUNL
— Data obtained from measurements[1] recently performed at the High Intensity $\vec{\gamma}$-ray Source (HI$\vec{\gamma}$S) are being analyzed to extract the Gerasimov-Drell-Hearn (GDH) integrand on the deuteron at γ-ray energies of 3.5, 4.0, 6.0, and 10.0 MeV. Linearly polarized γ-rays were used to extract the shape of the polarized differential cross section for the $d(\vec{\gamma}, n)p$ reaction near breakup threshold using the 88 neutron detectors of the BLOWFISH array. The coefficients of a Legendre polynomial expansion of the data were extracted and written in terms of the amplitudes and phases of the transition matrix elements. A grid search was performed to determine the amplitudes of the T-matrix elements, using the phase shifts obtained from n-p scattering data[2] to fix the relative phases. The amplitudes are used in a low-energy expansion of the GDH integrand to determine the integrand values at each energy. This talk will provide a brief overview of the experiment, describe how the amplitudes were extracted, and compare the results obtained for the GDH integrand to theory[3].

[1]B. Sawatzky, Ph.D. thesis, Univ. of Virginia, 2005.
[2]SAID Analysis, http://gwdac.phys.gwu.edu/.
[3]H. Arenhövel *et al.* Nucl. Phys., **A631**(1998) 612c.

Matthew Blackston
Duke University/TUNL

Date submitted: 14 Jan 2006 Electronic form version 1.4