Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

Gamma rays from neutron scattering in ^{18}O SADIA CHOUDRY, NICO ORCE, VIJI VARADARAJAN, SHELLY LESHER, DIPA BANDYOPADHYAY, SHARMISTA MUKHOPADHYAY, STEVE YATES, MARCUS MCELLISTREM, University of Kentucky — A neutron scattering experiment in ^{18}O has been concluded using both neutron and γ-ray detection measurements. The γ-ray measurements provide the relative decay intensities of many excited levels. These, branching ratios of level-decays, and known lifetimes enable us to provide or affirm previously obtained E2 and M1 decay intensities. Simple sd-space shell model tests, repeated here, provide the dominant configurations for the excited levels of ^{18}O. Calculations for the several 2^+excited levels show largely mixed configurations, with $(d)^2$ and (sd) configurations. But the lowest 3^+ level, at 5377.8 keV excitation energy, shows a 98% $(s_{1/2}d_{5/2})$ configuration, illustrating why that level in ^{18}Ne plays such a strong role in the astrophysically important p + ^{17}F reaction. The energy spread in the experiment, 250 keV, was sufficient to average over several levels in the compound system, so the scattering cross sections could be well represented by statistical models (StatM). At incident energies where direct coupling alters inelastic scattering cross sections, deviations from the StatM would be evident, indicating the energy is high enough to discern the direct amplitude, and with it, provide a test of the mirror symmetry between ^{18}O and ^{18}Ne.

Sadia Choudry
University of Kentucky

Date submitted: 20 Jun 2006 Electronic form version 1.4