

Abstract Submitted
for the HAW05 Meeting of
The American Physical Society

Simultaneous measurement of (n,γ) and $(n,\text{fission})$ cross sections with the DANCE 4π BaF_2 array T.A. BREDEWEG, M.M. FOWLER, E.M. BOND, M.B. CHADWICK, E.-I. ESCH, L.F. HUNT, J.M. O'DONNELL, R.S. RUNDBERG, J.M. SCHWANTES, J.L. ULLMANN, D.J. VIEIRA, J.B. WILHELMY, J.M. WOUTERS, LANL, T. ETHVIGNOT, T. GRANIER, CEA-DAM, R.R.C. CLEMENT, R.A. MACRI, J.A. BECKER, LLNL, J.E. YURKON, NSCL — Neutron capture cross section measurements on many of the actinides are complicated by low-energy neutron-induced fission, which competes with neutron capture to varying degrees depending on the nuclide of interest. Measurements of neutron capture on ^{235}U using the Detector for Advanced Neutron Capture Experiments (DANCE) have shown that we can partially resolve capture from fission events based on total photon calorimetry. The addition of a fission-tagging detector to the DANCE array will greatly improve our ability to separate these two competing processes so that improved neutron capture and $(n,\gamma)/(n,\text{fission})$ cross section ratio measurements can be obtained. Such an addition to the DANCE array will also provide a means to study several important issues associated with neutron-induced fission, including $(n,\text{fission})$ cross sections as a function of incident neutron energy, and total energy and multiplicity of prompt fission photons. We have focused on two detector designs with complementary capabilities, a parallel-plate avalanche counter and an array of solar cells. Results from the initial in-beam tests of these two designs will be presented.

Todd Bredeweg
Los Alamos National Laboratory

Date submitted: 23 May 2005

Electronic form version 1.4