
AN OVERVIEW OF DANCE: A 4π BaF₂ DETECTOR FOR NEUTRON CAPTURE MEASUREMENTS AT LANSCE

J. L. Ullmann

Los Alamos National Laboratory

The Detector for Advanced Neutron Capture experiments (DANCE) is a 162-element, 4π BaF₂ array designed to make neutron capture cross-section measurements on rare or radioactive targets with masses as little as 1 mg. Accurate capture cross sections are needed in many research areas, including stellar nucleosynthesis, advanced nuclear fuel cycles, waste transmutation, and other applied programs. These cross sections are difficult to calculate accurately and must be measured. Up to now, except for a few long-lived nuclides there are essentially no differential capture measurements on radioactive nuclei. The DANCE array is located at the Lujan Neutron Scattering Center at LANSCE, which is a continuous-spectrum neutron source with useable energies from below thermal to about 100 keV. Data acquisition is done with 320 fast waveform digitizers. The design and initial performance results, including background minimization, will be discussed.