Nuclear Physics Measurements for Homeland Security

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A number of homeland security projects related to the detection of special nuclear material, non-proliferation, and nuclear forensics require new measurements of basic nuclear physics properties such as nuclear resonance fluorescence strengths, neutron-induced reaction cross sections, gamma-ray energy spectra and multiplicity distributions from fission, beta-delayed neutron energies and intensities, as well as techniques to assay extremely low levels of radioactive materials. Our group at UC Berkeley is collaborating with groups from Lawrence Livermore National Laboratory, Lawrence Berkeley National Laboratory, Los Alamos National Laboratory, and Argonne National Laboratory to carry out a series of experiments in these areas. Such experiments are excellent training grounds for both undergraduate and graduate students. In this talk I will show examples of the kind of research we are performing.