Abstract Submitted
for the 4CF11 Meeting of
The American Physical Society

**Study of the fission spectrum of less than 1 MeV neutrons using a Lithium-glass detector** SURAJ BASTOLA, LAWRENCE REES, CZIRR BART, NUCLEAR PHYSICS RESEARCH GROUP TEAM — The fission spectrum of neutrons with kinetic energies less than 1 MeV is of considerable practical importance for the design of nuclear reactors. However, it is not as precisely known as that for higher energy neutrons. One of the major problems scientists have previously encountered is room return neutrons. These are neutrons that reflect from the walls, ceiling or floor of the lab. Another problem is finding a way to measure accurately the neutron time of flight. This is the time neutrons take to travel from a fission event to the detector. Time of flight is used to measure the neutron energy. To avoid the room return, I am going to perform an experiment about 45 feet above the ground in the BYU Indoor Practice Facility, so that neutrons from the source will not scatter from nearby surfaces and return to the detector. To find the time of flight to a greater accuracy, I have been using a Time to Amplitude Converter (TAC). A TAC has a capacitor that charges linearly as the voltage builds up. With a 12-bit digitizer system, we can measure the time to 0.1 nanoseconds, whereas the same digitizer can only measure time in steps of 4 nanoseconds. So, we will get a more accurate measurement of time of flight with the TAC.

Suraj Bastola

Date submitted: 16 Sep 2011 Electronic form version 1.4