

New method of neutrino and anti-neutrino detection from 0.2 to 100 MeV

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We have developed a neutrino detector with threshold energies from ~0.2 to 100 MeV in a clean detection mode almost completely void of spurious backgrounds. It was initially developed for the NASA neutrino Solar Orbiting Lab project to put a solar neutrino detector very close to the Sun with 1000 to 10,000 times more solar neutrino flux than on Earth, but similar interactions have been found for anti-neutrinos; again, initially intended for Beta decay neutrinos from reactors, geological sources or for nuclear security applications. However, the technique works at the 10 to 100 MeV region for neutrinos from the ORNL Spallation Neutron Source or low energy accelerator neutrino and anti-neutrino production targets less than ~100 MeV. Its identification process is clean with a double pulse detection signature within a time window between the first interaction producing the conversion electron or positron and the secondary nuclear excited state gamma emission delayed 100 to 1000 ns, which removes most spurious background events. These new modes for neutrino and anti-neutrino detection of low energy neutrinos and anti-neutrinos, could allow improvements to neutrino low energy neutrino production measurements from accelerator targets.

Working Group

WG 6: Detectors

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