

RED-100 detector for the first observation of the elastic coherent neutrino scattering off xenon nuclei

Wednesday, 7 October 2015 13:15 (15)

The RED-100 (Russian Emission Detector) is being constructed for the experiment on the first observation of elastic coherent neutrino scattering off atomic nuclei. This fundamental process was predicted several decades ago by the Standard Model of electroweak interactions but has not been discovered yet. The RED-100 is an emission two-phase xenon detector containing ~200 kg of the liquid Xe (~100 kg in a fiducial volume). One of the possible sites to carry out the experiment is SNS (Spallation Neutron Source) facility at Oak Ridge National Laboratory, USA. SNS is the world's most intense pulsed source of neutrinos and unique facility for their properties studying. The energy spectrum of neutrinos produced at the SNS source extends up to ~50 MeV and satisfy coherence condition. These neutrinos give kinetic energies of Xe recoils up to a few tens of keV where the response of LXe is well-known from neutron calibration of dark matter detectors. The detector will be deployed in a basement under the experimental hall at a distance of ~30 meters from the SNS target. The expected signal and background (neutron and gamma) are estimated for this specific location. The detector details, current status and future plans are given.

Presentation type

Section talk (10+5 min)

Primary author(s) : KHROMOV, Alexander (NRNU MEPhI)

Presenter(s) : KHROMOV, Alexander (NRNU MEPhI)

Session Classification : Nuclear physics and particle physics - parallel VI

Track Classification : Nuclear physics and particle physics