



Contribution ID: 15

Type: Poster

Status of investigations of neutrino properties with the ν GEN spectrometer at Kalinin Nuclear Power Plant

Tuesday, 4 June 2019 19:05 (23 minutes)

The ν GEN project is aimed to study neutrino scattering at the close vicinity of the reactor core of Kalinin Nuclear Power Plant. The main interests are connected with the detection of coherent elastic neutrino-nucleus scattering (CEvNS) and magnetic moment of neutrino. A magnetic moment is the fundamental parameter of the neutrino and its investigation may lead to results beyond the standard concepts of elementary particle physics and astrophysics. CEvNS is a process predicted by the Standard Model, but has not been observed for reactor neutrino yet. The detection of this process would be an important test of the Standard Model. Such observation can also help for the search for non-standard neutrino interactions, sterile neutrinos and other investigations. The experimental setup is constructed under the reactor #3 of KNPP at the distance of 10 m from center of the core. In this way, we obtain an enormous antineutrino flux of more than $5 \cdot 10^{13} \nu / (\text{cm}^2 \cdot \text{s})$. A special lifting mechanism allows to move spectrometer away from the reactor core changing the neutrino flux and thus suppressing main systematic errors caused by possible long-term instability and knowledge of neutrino flux. To detect signal from neutrino scattering we use low-threshold germanium detectors surrounded by passive and active shielding. Current status of the experiment will be presented at the conference.

Collaboration name

ν GEN

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Session Classification: Poster session

Track Classification: Neutrino Physics