

New results from the DANSS experiment

Friday, 21 June 2024 17:30 (2 hours)

New results from the DANSS experiment on the searches for sterile neutrinos are presented. They are based on 8.5 million inverse beta decay events collected at 10.9, 11.9, and 12.9 meters from the 3.1 GW reactor core of the Kalinin Nuclear Power Plant in Russia. Additional 0.8 million of antineutrino events collected in 2023 further improves the sensitivity for the sterile neutrino mixing parameter below 0.01 for a sterile neutrino mass around 1 eV. Obtained limits exclude practically all sterile neutrino parameters preferred by the recent BEST results for Δm^2 below 5 eV². The neutrino spectrum dependence on the ²³⁹Pu fission fraction is presented. It agrees with the predictions of the Huber-Mueller model. Using this dependence, the ratio of cross sections for ²³⁵U and ²³⁹Pu was extracted. It also agrees with the Huber-Mueller model and somewhat larger than in other experiments. The accuracy in the determination of the ²³⁹Pu fission fraction from the IBD positron spectra is estimated. The reactor power was measured using the IBD event rate during 7.5 years with a statistical accuracy of 1.5% in 2 days and with the relative systematic uncertainty of less than 0.5%. The neutrino oscillation analysis using the predictions for the absolute antineutrino flux from the reactor with a conservative systematic error of 5% excludes practically all sterile neutrino parameter space preferred by the recent BEST results as well as the best fit point of the Neutrino-4 experiment. The fraction of the reactor antineutrino yield with energies above 8 MeV is measured. Such antineutrinos are important for searches of neutrino coherent scattering.

Given name

Nataliya

Surname

Skrobova

Second affiliation

Gender

Female

Collaboration (if any)

DANSS

Poster prize

No

First affiliation

Institutional email

Primary author: SKROBOVA, Nataliya

Presenter: SKROBOVA, Nataliya

Session Classification: Poster session and reception 2

Track Classification: Reactor neutrinos