Contribution ID: **6** Type: **not specified**

New scintillation strip design for the DANSS detector upgrade

Friday, 8 September 2023 12:00 (20 minutes)

DANSS detector at Kalininskaya nuclear power plant demonstrates excellent performance in antineutrino detection. Counting rates of up to 5000 events per day made it possible to record more than 6.5 million antineutrino events in 6 years of remarkably stable operation. The data sample is extremely clean and features the signal to background ratio in excess of 50. Yet only moderate energy resolution of 34% at 1 MeV limits the sensitivity of the experiment for the sterile neutrino searches.
The upgrade of the detector is aimed at more than twice better energy resolution of 12% at 1 MeV. Besides that the sensitive volume is planned to be increased by 70% inside the same shielded space on the lifting platform, leading to almost twice higher the counting rate. New scintillation strips feature much better uniformity of the light collection. Readout from both strip edges provides information on the longitudinal event coordinate. The talk will address the details and the status of the upgrade together with the latest results of beam tests. The expected influence of the improvements on the sensitivity to the sterile neutrino will also be discussed.

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Session Classification: H4