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First measurements of ^{239}Pu fission fraction and long term reactor power monitoring using antineutrino spectrum

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The highly segmented DANSS anti-neutrino scintillation detector is located at the Kalinin NPP and collects up to 5000 antineutrino events per day. The reactor power was measured using the inverse beta-decay (IBD) event rate during 7.5 years with an accuracy of 1.3% in 3 days and with the relative systematic uncertainty of less than 0.8%. The report will present the measured dependence of the antineutrino spectrum on the composition of reactor fuel. The measured ratio of cross-sections $^{235}\text{U}/^{239}\text{Pu}$ will be presented. The ^{239}Pu fission fraction was measured during 7 years of the reactor operation using a fit of the measured IBD positron spectrum with model predictions for different isotopes. Taking into account the absolute antineutrino counting rates, the parameters of a hypothetical sterile neutrino region was extended above $\Delta m^2 > 5 \text{ eV}^2$, where there are indications of the existence of a sterile neutrino in the BEST and Neutrino-4 experiments

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