

Power reactor monitoring with antineutrinos by the DANSS detector

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DANSS detects antineutrinos from a 3.1 GW_{th} power reactor of Kalininskaya NPP for almost 9 years. The data sample is about 10 million events and features excellent signal to background ratio in excess of 50. Along with the leading results in the sterile neutrino searches, DANSS demonstrates various opportunities of antineutrino application for practical purposes of reactor monitoring. The talk will present the observation of the reactor power with the relative systematic uncertainty about 0.8%, as well as the reconstruction of the fission fractions in the reactor core with the accuracy, comparable to that from the fuel evolution calculations. A simple but effective approach to determine the antineutrino yield ratio from ²³⁵U and ²³⁹Pu fuel isotopes will be discussed. The analysis of the data from more than 5 full fuel campaigns makes possible the decomposition of the neutrino spectra from the two major burning isotopes. The DANSS detector reliably proves the possibility to use antineutrinos as a totally independent way of the monitoring of the reactor core parameters with accuracies, comparable or even better than that from the conventional methods.

Collaboration you are representing

DANSS

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