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The influence of reactor neutrino energy spectra for constraints on amplitude of coherent elastic neutrino-nucleus scattering

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This report shows how the current models of reactor antineutrino energy spectra affect the estimates of the count rate for coherent elastic neutrino-nucleus scattering ($\text{CE}\nu\text{NS}$) in the RED-100 experiment. The reactor antineutrino spectrum consists of contribution from 4 main (parent) isotopes ^{235}U , ^{238}U , ^{239}Pu , ^{241}Pu , taken with partial coefficients on the burn-up moment. We analyze and compare the spectra-averaged differential cross-section for each model and compared the resulting $\text{CE}\nu\text{NS}$ count rate in RED-100 at a distance of ~ 19 meters from reactor core at the Kalinin nuclear power plant (KNPP). The calculations performed show the difference between count rate estimations for each model and the corresponding constraints on $\text{CE}\nu\text{NS}$ cross-section amplitude. It is shown that the reactor high energy antineutrinos make a significant contribution to the prediction value.

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