

Measurement of Reactor Antineutrino Spectra from ^{235}U and ^{239}Pu Fission at RENO

The RENO experiment reports the separated reactor antineutrino spectra of ^{235}U and ^{239}Pu from the data sets of 2500 days of near data. As the fission fractions changes as the fuel cycle evolve, the contribution from different fissile isotopes to the measured spectrum can be identified. The separated prompt spectra are unfolded to antielectron neutrino spectra where the detector effect is nearly removed. The IBD yield of ^{235}U (^{239}Pu) is measured as 6.17 ± 0.02 (4.19 ± 0.24) $\text{cm}^2/\text{fission}$. The separated spectra of ^{235}U show clear excess in 5 MeV (6 MeV) of prompt (neutrino) energy region with the 3.9σ of significance, while excess in ^{239}Pu is milder than ^{235}U and consistent with the Huber model with 1.1σ significance.

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