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Reactor antineutrino anomaly in light of recent flux model refinements

Friday, 8 July 2022 15:00 (15 minutes)

We study the status of the reactor antineutrino anomaly in light of recent reactor flux models obtained with the conversion and summation methods. We present a new improved calculation of the IBD yields of the standard Huber-Mueller (HM) model and those of the new models. We show that the reactor rates and the fuel evolution data are consistent with the predictions of the Kurchatov Institute (KI) conversion model and with those of the Estienne-Fallot (EF) summation model, leading to a plausible robust demise of the reactor antineutrino anomaly. We show that the results of several goodness of fit tests favor the KI and EF models over other models that we considered. We also discuss the implications of the new reactor flux models for short-baseline neutrino oscillations due to active-sterile mixing. We show that reactor data give upper bounds on active-sterile neutrino mixing that are not very different for the reactor flux models under consideration and are in tension with the large mixing required by the Gallium anomaly that has been refreshed by the recent results of the BEST experiment. The data-driven isotopic IBD yields can also be obtained from global fits of the experimental rate and evolution data, which provide an anomaly-free model for the prediction of future experiments.

This presentation is based on the following two publications:
[1] C. Giunti, Y. F. Li, C. A. Ternes, and Z. Xin, Reactor antineutrino anomaly in light of recent flux model refinements, (2021), arXiv:2110.06820.
[2] Y. F. Li and Z. Xin, Model-Independent Determination of Isotopic Cross Sections per Fission for Reactor Antineutrinos, (2021), arXiv:2112.11386.

In-person participation

No

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