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Search for sterile neutrino mixing at Daya Bay

The Daya Bay Reactor Neutrino Experiment is designed to measure the neutrino mixing angle θ_{13} with unprecedented precision. The experiment detects antineutrinos from the Daya Bay reactor complex with eight functionally identical Antineutrino Detectors, which are distributed among three experimental halls. Since December 2011, we have recorded more than one million reactor antineutrino interactions.
This high-statistics data set allows us to not only make precise measurement of oscillation parameters, but also to search for new physical phenomena beyond the standard model, such as sterile neutrino mixing.
We have made the most precise measurements of $\sin^2 2\theta_{13}$ and the first direct measurement of the effective mass splitting, Δm^2_{ee}, from relative comparisons of antineutrino rate and spectra. A signature of sterile neutrino mixing would appear as an additional spectral distortion of a different frequency. A number of improvements are made to our oscillation analysis framework in order to search for this subtle spectral distortion. In this poster, we will discuss the current status of sterile neutrino searches at Daya Bay.

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