

Experimental study of decoherence effects in neutrino oscillations in Daya Bay

Authorship annotation

for the Daya Bay collaboration

Session and Location

Monday Session, Poster Wall #160 (Ballroom)

Abstract content

The plane-wave model of neutrino oscillation based on treatment of neutrinos as states with definite momentum relies on controversial assumptions. A self-consistent description of neutrino oscillation treats propagating neutrinos as a coherent superposition of plane-wave states — wave packet (WP). In a model with WP, neutrino oscillations depend on an additional parameter — momentum dispersion of the wave packet. This approach was never investigated experimentally till recently. The Daya Bay experiment, using eight functionally identical detectors located at three experimental halls, collected high statistics antineutrino sample from six nuclear reactors. Multiple detector-reactor baselines provide an opportunity to test the decoherence effect in neutrino oscillations. The results of our analysis of the Daya Bay data within a wave packet model of neutrino oscillation including the first experimental limit on relative wave packet momentum dispersion are presented in this poster.

Poster included in proceedings:

yes

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