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Search for the eV-scale sterile neutrino at a very short baseline - status and perspectives

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From the discovery of the neutrino to the measurement of θ_{13} , the last unknown neutrino mixing angle, nuclear reactors have proved to be a fundamental tool to study these particles, of which much remains to be unveiled. Measurements involving reactor antineutrinos rely on the prediction of their energy spectrum, a non-trivial exercise involving ad-hoc methods and carefully selected assumptions.

A discrepancy between predicted and measured antineutrino fluxes at a few meters distance from reactors arose in 2011, prompting a series of experimental efforts aimed at studying neutrino oscillation at a baseline that was never tested before. This so-called reactor antineutrino anomaly can, in fact, be accounted for by invoking the existence of new sterile neutrinos at the eV mass scale that participate in the neutrino mixing, an appealing hypothesis tying to other anomalies already observed in the neutrino sector, that opens a door for physics beyond the Standard Model.

With this talk, the author intends to give an overview of the most recent results of the projects involved in the search for reactor antineutrino oscillation at a very short baseline, as well as their implication in our current understanding of the reactor antineutrino anomaly and the eV-scale sterile neutrino hypothesis.

Submitted on behalf of a Collaboration?

No

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