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Particle Theory Seminar of LPT Orsay

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Titre : *Status of the reactor anomaly*

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Résumé : *The measurements of anti-neutrinos fluxes coming from nuclear reactors present a deficit with respect to the theoretical predictions, what is known as the reactor anti-neutrino anomaly. A new neutrino mass eigenstate in the eV range could solve the problem, although recent experimental results : the existence of an unpredicted bump in the reactor anti-neutrino spectrum and the dependance of the flux deficit on the fission isotopes ; suggest a miscalculation on the fluxes, disfavoring the sterile neutrino hypothesis. Using all electron disappearance data available, it is found that the sterile neutrino hypothesis can not be rejected. Based on that, a global analysis, using the theoretical flux predictions, gives a 3 sigma significance to the sterile oscillation with respect to the no oscillation. A more conservative analysis of the sterile oscillation, not taking any assumption for the fluxes i.e. leaving the fluxes to vary freely, also gives a 2 sigma significance for the sterile oscillation. Being the sterile neutrino hypothesis still compatible with the reactor anomaly. In this talk I will introduce the reactor anomaly and the new experimental results in order to explain the reactor data analysis as well as the global electron neutrino disappearance analysis performed.*

Reference : https ://arxiv.org/abs/1709.04294