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In quest of sterile neutrinos, an experimental review

The possibility of mixing between standard active neutrinos and neutrino fields which are singlets under the gauge symmetries of the Standard Model is a natural consequence of neutrino non-zero masses. The discovery of a sterile neutrino state would have profound impact on our understating of particle physics and on the evolution of the Universe. Recent tensions between world-wide experimental data renewed the possibility of at least a sterile neutrino state with mass around 1 eV to explain the observations. Here we provide an updated review of the rapidly evolving experimental scenario which provides at the same time hints in favor of and in contradiction to the sterile neutrino hypothesis. Finally we discuss the current planned experimental activities aiming at definitively unravel this longstanding issue.

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