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Direct Search of Warm Dark Matter keV Neutrinos In Next Generation Tritium Beta Decay Experiments

In this poster a sensitivity study of detecting sterile keV neutrinos in tritium beta decay will be presented. Relic sterile neutrinos in the keV range are classical candidates for the so-called Warm Dark Matter. They can explain mass distributions in the sub-galactic scale and thereby resolve the tensions in purely Cold Dark Matter scenarios, while being consistent with observations of the large scale structures.

This work shows that from a purely statistical point of view a future KATRIN-like experiment can reach a sensitivity of a mixing angle down to $\sin^2 2Q \sim 10^{-8}$, probing the cosmologically favored parameter space. We investigate the effect of theoretical and experimental uncertainties using different analysis techniques based on spectral fits, covariance matrix approach and discrete wavelet transform.

Primary authors: Dr MERTENS, Susanne (Lawrence Berkeley National Laboratory); Dr LASSERRE, thierry (CEA)

Presenters: Dr MERTENS, Susanne (Lawrence Berkeley National Laboratory); Dr LASSERRE, thierry (CEA)

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