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Search for a 4th neutrino state with CeLAND

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Several anomalies observed in neutrino oscillation data can be explained by a hypothetical fourth neutrino separated from the three standard neutrinos by a squared mass difference of a few eV2.
We show that this hypothesis can be tested with a PBq (ten kilocurie scale) 144Ce antineutrino beta source deployed at the center of the KamLAND detector.
In particular, the compactness of such a source with respect to the important size of the detector could yield an energy-dependent oscillating pattern in event spatial distribution that would unambiguously determine these new neutrino mass differences and mixing angles.

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