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Short baseline neutrino and anti-neutrino oscillation studies at the CERN-SPS.

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The possibility of mixing between standard active neutrinos and neutrino fields which are singlets under the gauge symmetries of the Standard Model was proposed a long time ago. Recent tensions between world-wide experimental data renewed the possibility of at least a sterile neutrino state to explain the observations. While a huge effort is being devoted to resolve the standard three-neutrino mixing paradigm at present no resolute experimental setup was carried out or proposed to unambiguously settle these anomalies. Here we present the proposal for an experimental search for sterile neutrinos with a new CERN-SPS neutrino beam using muon spectrometers and large LAr detectors. To definitively clarify the physics issue the proposed experiment will study oscillations in a muon neutrino/antineutrino beam both in appearance and disappearance modes in the eV^2 square mass difference region.

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