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Search for Sterile antineutrinos in MINOS

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The MINOS experiment measures the disappearance of νμ and ν¯μ using two detectors separated by 734 km. The magnetized MINOS detectors enable to separate neutrinos and antineutrinos on an event-by-event basis. Besides the precise standard three flavor oscillation, MINOS is also capable of looking for sterile neutrino signal driven by large mass splittings. MINOS has taken data in antineutrino mode, the $\bar{\nu}\mu \rightarrow \bar{\nu}s$ oscillations are studied in a 3+1 sterile antineutrino model with one additional sterile antineutrino state and the mixing parameters θ24 and Δm243 are constrained. We present the sensitivity to sterile antineutrino in the antineutrino enhanced mode over a large parameter space of Δm241 ($10{-}3 \leq \Delta m241 \leq 100$ eV2) favoured by the LSND and MiniBooNE experiments. By combining our data with the reactor disappearance results we will be able to make a direct comparison with the appearance results of LSND and MiniBooNE.

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