

Measurement of Neutrino and Antineutrino Oscillation Parameters Using the Complete Atmospheric and Beam Data Sets from MINOS

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The MINOS detectors are used to collect data from the NuMI neutrino beam as well as atmospheric neutrino data. The atmospheric data taken by the Far Detector, located underground at a depth of 2070 meters-water-equivalent and at 735 km from the neutrino production target, is combined with beam data from both Near and Far Detectors to measure the neutrino and antineutrino mixing parameters. Because our detectors are magnetized, we are able to separate neutrinos and antineutrinos on an event-by-event basis. This allows us to analyze the complete MINOS data set under two possible scenarios: assuming neutrinos and antineutrinos have different oscillation parameters; and assuming their corresponding parameters are identical. We report the world-leading measurement of the neutrino and antineutrino atmospheric mass splitting parameter along with the most precise comparison to date of neutrino and antineutrino oscillation parameters.

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