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P3.077 Super-Kamiokande solar neutrino results and NSI analysis

P Weatherly

University of California, Irvine, USA

on behalf of Super-Kamiokande collaboration

Super-Kamiokande detects the Cerenkov light from elastic scattering of solar ${}^8\text{B}$ neutrinos with electrons in its ultra-pure water. The directionality, energy and timing of the recoil electrons determines the interaction rate, the flight path, as well as the energy dependence of the ${}^8\text{B}$ neutrinos' electron-flavor survival probability P_{ee} . While the P_{ee} below ~ 1 MeV is equivalent to averaged vacuum neutrino flavor oscillations, the P_{ee} above ~ 7 MeV is suppressed by the Mikheyev-Smirnov-Wolfenstein (MSW) resonance resulting from the interaction of the solar neutrinos with solar matter. In the same way, Earth matter effects influence P_{ee} , leading to an apparent Day/Night effect. Non-standard interactions (NSI) extend the MSW model to include interactions between the quarks in matter and neutrinos, thereby modifying P_{ee} . We will present the signatures of matter effects on solar neutrinos in Super-Kamiokande and present limits on NSI parameters, in particular couplings to the down quark.