

IT05-2010-004271

Abstract Submitted
for the IT05 Meeting of
The American Physical Society

Sorting Category: 2.1 (T)

The Nature and Magnitude of the Neutrino Mass GUSTAVO MONTEIRO, Stony Brook University — Proposed by Pauli in 1930, in order to save the energy conservation law, neutrinos have been intriguing physicists since then. The reason is those particles are really difficult to measure because they just interact weakly. Neutrinos are taken to be massless in the Standard Model, however, nowadays, we know from experiments that such particles must be massive. In 2001, the Sudbury Neutrino Observatory provided a clear evidence of neutrino flavor change, what implies that neutrinos cannot be massless and, moreover, their eigenstates of flavor are not the same of their mass eigenstates in order to have such oscillation. Actually, the interesting point is this phenomenon was introduced by Bruno Pontecorvo in 1957, but just 44 years later, physicists were able to check it in a trustable manner by experiments. This presentation discusses about the implication of neutrino masses in the Standard Model. A calculation for the transition probability of a neutrino changing its flavor is provided as well as some predictions from theories beyond the Standard Model, such as neutrinoless double beta-decay. Finally, the experimental techniques to measure the neutrino masses are given in some detail.

Prefer Oral Session
 Prefer Poster Session

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Date submitted: 15 Oct 2010

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