Contribution ID: **1** Type: **not specified**

Cosmic Neutrino Flavor Ratios with Broken ν_μ-ν_τ Symmetry

Tuesday, 14 May 2013 14:30 (20 minutes)

Reactor neutrino experiments have now observed a nonzero value for \theta_{13} with a significance above 10-sigma. Nonzero values for theta_13 break a ν_μ-ν_τ symmetry, which has qualitative as well as quantitative implications for the time-evolution of neutrino flavors. In particular, the large-distance flavor evolution matrix, non-invertible with ν_μ-ν_τ symmetry, becomes invertible. This means that measurements of neutrino flavor ratios at Earth can now be inverted to directly reveal the flavor ratios injected at cosmically distant sources. With the updated values of the three neutrino mixing angles, we obtain the inverted large-distance evolution matrix and use it to derive several phenomenological relations between the injection flavor ratios and the observable ratios at Earth. Taking the three popular injection models as examples, we also exhibit the shift of Earthly observed flavor ratios from the corresponding values in the case with ν_μ-ν_τ symmetry.

Summary

Stated in abstract

Primary author: WEILER, Thomas J (Vanderbilt University)

Co-authors: Dr HO, Chiu Man (Vanderbilt University); Mr FU, Lingjun (Vanderbilt University)

Presenter: WEILER, Thomas J (Vanderbilt University)

Session Classification: Neutrino Astrophysics II

Track Classification: Neutrino Astrophysics Parallel