38th INTERNATIONAL CONFERENCE ON HIGH ENERGY PHYSICS
AUGUST 3 - 10, 2016
CHICAGO

Contribution ID: **515** Type: **Poster**

A Predictive Model of Dirac Neutrinos

Monday, 8 August 2016 18:30 (2 hours)

Most of the theoretical work for the models of neutrino masses and mixings uses the neutrinos to be of Majorana type. This is due to the fact that the most elegant mechanism for the neutrino mass generation is the see-saw mechanism in which the neutrinos are indeed Majorana particles. However, experimentally it is not yet established whether the neutrinos are Majorana or Dirac particles. In this talk, I will discuss a model in which the tiny masses for the neutrinos generated are of Dirac type. The model is an extension of the SM, and contains three right handed (RH) massless neutrinos, and one additional Higgs doublet which couples only to the neutrinos. This is achieved using a discrete Z_2 symmetry which is spontaneously broken due to a tiny vev of this 2nd Higgs doublet. Lepton number conservation is also assumed so the RH neutrinos cannot acquire large Majorana masses. The astrophysical constraints allow the VEV of the 2nd Higgs doublet in the keV scale. This small scale eliminate the necessity of very tiny Yukawa coupling as would be the case in the SM with RH neutrinos. With some additional reasonable assumptions, and some extra symmetry among the RH neutrinos, we construct a concrete model for the Dirac neutrino mass matrix which can reproduce the currently measured neutrino mass difference squares, and the mixing angles. The model (with only four parameters) also predict the neutrino mass hierarchy to be of inverted type, masses of all the neutrinos, and the leptonic CP violating phase , delta, to be close to 270 degrees. Other proposed models for the neutrino mass matrix of Dirac type will also be briefly reviewed.

Primary author: Prof. NANDI, Satyanarayan (Oklahoma State University)

Co-authors: Dr GHOSH, Kirtiman (University of Delhi, India); Dr CHAKDAR, Shreyashi (University of Virginia)

Presenter: Prof. NANDI, Satyanarayan (Oklahoma State University)

Session Classification: Poster Session

Track Classification: Neutrino Physics