

Phenomenological study of texture zeros in Dirac neutrinos

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Abstract:

After classifying all the possible texture zeros in light Dirac neutrino mass matrix in diagonal charged lepton basis, we studied the phenomenology of the texture zeros that are compatible with recent neutrino data. We consider the general (non-Hermitian) nature of the neutrino mass matrix which leads to more possibilities and freedom due to additional CP phases, mixing angles not constrained by neutrino data. We find that textures up to four zeros are allowed in the Dirac neutrino mass matrix by recent neutrino data. The allowed textures are found to give interesting correlations between the light neutrino parameters, especially the neutrino parameters which are not yet perceived with accuracy, the atmospheric mixing angle and the Dirac CP phase, with sharp distinction between the normal and inverted orderings. We try to find the symmetry realizations of some of the allowed texture structures using the Dihedral group D_4 and cyclic group Z_2 . The cosmology bound (PLANCK 2018) on the sum of the neutrinos has been taken into account while finding the allowed texture structures. We then discuss some prospectives of the work from a flavour symmetric point of view.

Keywords: texture zero, Dirac neutrinos

References:

1. C. Hagedorn and W. Rodejohann, JHEP07 (2005)034.
2. E. Ma and O. Popov, Phys. Lett.B 664, 142
3. H. Borgohain, M.K. Das and D. Borah, JHEP 06(2019),064
4. H. Borgohain and D. Borah, J.Phys.G.Nucl.Part.Phys , 48 075005