Contribution ID: **3** Type: **Talk: in-person**

Connecting high-scale Leptogenesis with low-scale Dirac CP phase in a LRSM framework

We explore the connection between the low-scale CP-violating Dirac phase (δ) and high-scale leptogenesis in a Left-Right Symmetric Model (LRSM) with scalar bidoublets and doublets. The model's fermion sector includes one sterile neutrino (S_L) per generation, enabling a double seesaw mechanism. This mechanism, performed via type-I seesaw twice, generates a Majorana mass term for heavy right-handed (RH) neutrinos (N_R), with the light neutrino mass linearly dependent on the S_L mass. Assuming charge conjugation (C) as the discrete left-right (LR) symmetry helps derive the Dirac neutrino mass matrix (M_D) in terms of the light and heavy RH neutrino masses and the light neutrino mixing matrix U_{PMNS} (containing δ). We illustrate the viability of unflavored thermal leptogenesis via the decay of RH neutrinos using the obtained M_D with RH neutrino masses as inputs. Our analysis of the Boltzmann equations shows that the CP-violating Dirac phase alone can produce the required leptonic asymmetry. Importantly, we highlight that current and near-future oscillation experiments, like DUNE, aiming to refine δ, can potentially constrain our model and thus serve as a probe for early Universe leptogenesis indirectly.

Working Group

WG 1: Neutrino Oscillation Physics

Primary author: Mr PATEL, Utkarsh (Indian Institute of Technology, Bhilai)

Co-authors: Mr ADARSH, Pratik (Indian Institute of Technology, Bhilai); Dr PATRA, Sudhanwa (Indian Institute of Technology, Bhilai); Dr SAHU, Purushottam (Indian Institute of Technology, Bombay)

Presenter: Mr PATEL, Utkarsh (Indian Institute of Technology, Bhilai)

Session Classification: Parallel: WG5

Track Classification: WG5: Neutrino Beyond PMNS