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W mass anomaly from CDF-II and neutrino phenomenology in minimal type-III seesaw using T' modular symmetry

Tuesday 13 December 2022 14:00 (1 hour)

In this work, we propose a model by extending the Standard Model (SM) with two right handed fermion triplet superfields (Σ_{R_i}), in presence of modular symmetry $\Gamma'_3 \sim \mathrm{A}'_4$, i.e., double cover of A_4 modular symmetry, also known as T' modular symmetry. It is crucial to identify the seesaw models in order to explain the neutrino mass generation, wherein the neutrino masses are naturally lowered due to the exchange of heavy right handed particles at tree level. As a consequence, we utilize type-III seesaw mechanism, which involves right-handed fermionic triplet for getting the correct masses for the active neutrinos as realized from neutrino oscillation data. The minimal extension with type-III seesaw framework is well-suited to explain neutrino phenomenology accurately. The T' symmetry has been used to analyze the different possible neutrino mass matrices which are expressed in terms of modulus τ introduced to break the modular symmetry. Our predictions include observables like neutrino mass square differences, mixing angles in the leptonic sector, Dirac phase and the absolute mass scale of neutrinos by suitably fixing model parameters. Alongside, we are also able to explain the recent measurements of the W boson mass published by CDF collaboration.

Session

Neutrino Physics

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