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Hybrid seesaw leptogenesis and TeV singlets (I)

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The appealing feature of inverse seesaw models is that the Standard Model (SM) neutrino mass emerges from the exchange of TeV scale singlets with sizable Yukawa couplings, which can be tested at colliders. However, the tiny Majorana mass splitting between TeV singlets, introduced to accommodate small neutrino masses, is left unexplained. Moreover, we argue that these models suffer from a structural limitation that prevents a successful leptogenesis if one insists on having unsuppressed Yukawa couplings and TeV scale singlets. We propose a hybrid seesaw model, where we replace the mass splitting with a coupling to a high scale seesaw module including a TeV scalar. We show that this structure achieves the goal of filling both the above gaps with couplings of order unity. In this talk, I will briefly describe the model, while the companion talk will discuss leptogenesis from this model in detail.

Summary

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