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## Lepton asymmetry in $S_3$ extended Standard Model

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Standard Model (SM) of electroweak interaction seems to be complete and consistent with almost all the data obtained so far, nevertheless, some deviations in the B sector are observed apart from the neutrino oscillation. It is believed that the SM is not a complete theory as we cannot explain the matter-anti matter asymmetry in our Universe in addition to the fact that the visible Universe contains just  $\sim 5\%$  of the total energy budget. We consider Leptogenesis in a minimal  $S_3$  extended standard model with a Higgs doublet and 3 right handed singlet Majorana neutrinos. We study the neutrino phenomenology from the flavor structure of the  $S_3$  invariant mass matrix and obtained the allowed parameter space for Dirac and Majorana phases. We have chosen the out of equilibrium decays of the right handed Majorana neutrinos to be in the temperature range of  $10^9$  to  $10^{12}$  GeV, where one flavor approximation is ruled out as the tau lepton comes to equilibrium. Hence we can distinguish between the  $\tau$  and other leptons flavor. Thereafter, we generate the lepton asymmetry by adding flavor effects coming individually from both  $\tau$  and other leptons sector. This two flavor approximation can generate an appreciable lepton asymmetry which can convert to the baryon asymmetry through sphaleron process which is in compatible with the experimental observation.

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