Contribution ID: **42** Type: **Talk**

Leptogenesis in GeV seesaw models with large mixing angles

Wednesday, July 13, 2016 3:15 PM (30 minutes)

We consider the dynamics of the standard model extended by two or more right handed neutrinos, which simultaneously explains the origin of neutrino masses through the seesaw mechanism and the baryon asymmetry of the universe through leptogenesis.
Specifically, we focus on right handed neutrinos with GeV scale mass which can be found in collider or fixed target experiments.
We use quantum kinetic equations to calculate the baryon asymmetry produced through right-handed neutrino oscillations in the early universe, and predict their properties from the requirement to explain the observed baryon asymmetry of the universe.
By identifying the time scales of oscillations and equilibration, and comparing them we find two regimes of production.
The *oscillatory* regime, where the oscillations happen much earlier than the equilibration of the right handed neutrinos, which is suitable for calculating
the baryon asymmetry for regions of parameter space where the mixing between the left- and right-handed neutrinos is small.
For large mixing angles we find the *overdamped* regime,
where one of the right handed neutrinos typically reaches equilibrium before the oscillations among the right handed neutrinos begin.
We develop analytic approximations for each of the two regimes, and use them to derive predictions of the right handed neutrino properties if they are responsible for the origin of matter.

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Session Classification: Parallel Track 3