

Cosmological Production of ROMP Dark Matter

Thursday 13 June 2024 15:00 (45 minutes)

Rapidly Oscillating Massive Particles (ROMPs) arise in quantum systems with non-diagonal interaction mass matrices. This misalignment between flavor and mass eigenstates leads to oscillations such as those between electron and muon neutrinos in the Standard Model, or between active and sterile neutrinos in Beyond the Standard Model frameworks to name just a few examples. In this talk, I will discuss the general framework for dark matter production via oscillations. I will focus on ROMP systems where one flavor state, χ , is weakly coupled to the Standard Model (and hence a good dark matter candidate) and the second flavor state, ψ , is strongly coupled to the Standard Model such that ψ oscillations to χ in the early universe can efficiently produce χ as the dark matter. I will discuss how oscillations, scatterings, thermal masses, and resonances all play a role to give ROMPs a rich cosmology.

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