Approximate Analytical Solutions to the Quantum Kinetic Equations in the Early Universe[1] LIHAO ZHENG, CHAD KISHIMOTO, Univ of San Diego — The quantum kinetic equations (QKEs) self-consistently describe the coherent quantum mechanical evolution and kinetic evolution induced by the scattering of particles. We solved the QKEs numerically for neutrinos in the hot and dense early universe where both neutrino flavor oscillation and scattering are important in the evolution of the neutrino states. The results show that the neutrino states reach an approximate equilibrium where the coherent and scattering effects balance. In this poster, we present approximate analytical solutions to the QKEs in this environment to better quantify and understand these numerical results.

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