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MeV-scale reheating temperature and thermalization of three active neutrinos by radiative and hadronic decays of massive particles

Wednesday, 5 December 2018 15:00 (30 minutes)

We study a possible minimum value of reheating temperature in terms of Big-Bang Nucleosynthesis by considering both radiative and hadronic decays of massive particles. In the current study, neutrino oscillation and neutrino self-interactions are also taken into account. We adopt updated observational bounds on the primordial abundance of light elements. We obtain the lower bound on the reheating temperature of 4 MeV – 5 MeV depending on the mass and hadronic branching ratio of the massive particles. Compared with cases with 100% radiative decay, we find that the change due to hadronic decays on the lower bound is of the order of O(10)%, whereas those of neutrino oscillation and neutrino self-interaction are of the order of O(1)%.

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