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Current constraints on cosmological scenarios with very low reheating temperatures

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We present a comprehensive analysis of the effects of models with very low reheating scenarios ($T_{\text{RH}} \sim \mathcal{O}(\text{MeV})$) on the cosmological observables and derive corresponding bounds on the reheating temperature. With respect to previous work, our study includes a more precise computation of neutrino distribution functions, leveraging the latest datasets from cosmological surveys.

We perform a joint analysis that combines constraints from Big Bang Nucleosynthesis, the Cosmic Microwave Background, and galaxy surveys, alongside separate investigations of these datasets, carefully assessing the impact of different choices of priors.

At the 95% confidence level, we establish a lower bound on the reheating temperature of $T_{\text{RH}} > 5.96 \text{ MeV}$, representing the most stringent constraint to date.

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