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CMB imprints of high scale non-thermal leptogenesis

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We study the imprints of high scale non-thermal leptogenesis on cosmic microwave background (CMB) from the measurements of inflationary spectral index (ns) and tensor-to-scalar ratio (r), which otherwise is inaccessible to the conventional laboratory experiments. We argue that non-thermal production of baryon (lepton) asymmetry from subsequent decays of inflaton to heavy right handed neutrinos (RHN) is sensitive to the reheating dynamics in early Universe after the end of inflation. Such dependence provides detectable imprints on the ns–r plane which is well constrained by the Planck experiment. We investigate two separate cases, (i) inflaton decays to radiation dominantly and (ii) inflaton decays to RHN dominantly which subsequently decays to the SM particles to reheat the Universe adequately. We obtain the corresponding estimates for ns and r and find the latter case to be more predictive in view of recent Planck/BICEP data. We furnish the results considering α– attractor inflationary models, however the prescription proposed here is quite generic and can be implemented to various kinds of single field inflationary models given the conditions for non-thermal leptogeneis is satisfied

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