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Probing low scale leptogenesis with inflationary blue-tilted GWs

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In Low scale leptogenesis(LSL) models there is a possibility of dynamically generating a small RH neutrino mass when a long-lived scalar field is coupled weakly to the RH neutrinos despite having a large VEV, v_Φ. Considering such a scenario, the correlation shared by the non-standard scalar era driven by Φ and M_is offers a unique opportunity to study the fingerprints of LSL on primordial gravitational waves. We study the gravitational waves originating due to the inflationary blue-tiled tensor power spectrum and propagating through the scalar epoch, which depending upon M_is provides two important insights. Firstly, if LSLs are taken seriously even for very high scale reheating GWs with a significant blue tilt don't violate the BBN bound. Secondly, It provides an opportunity to test LSLs with a low frequency and a complementary high frequency doubly peaked GW background. If recent results on GWs from PTAs are taken at face value and used at low frequencies as a measure, allows one to get possible signatures of LSL mechanisms at higher frequencies.

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