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Limits on light primordial black holes from high-scale leptogenesis

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Among mechanisms for generating the baryon asymmetry of the universe, leptogenesis is attractive since it simultaneously explains the small neutrino masses via the seesaw mechanism. Experiments offer some valuable constraints, but the parameter space of even minimal leptogenesis models are high-dimensional and difficult to probe directly. However considering a simple and well studied realisation, the SM is extended by three right-handed neutrinos N_i with $M_{N_i} > 10^{12}$GeV, the parameter space of leptogenesis can be indirectly and severely constrained by populations of Primordial Black Holes (PBHs). PBHs may form via the collapse of inflationary perturbations and inject particles and entropy into the universe. For $M_{PBH} < 10^{9}$GeV they evaporate completely before Big Bang Nucleosynthesis, potentially altering the dynamics of leptogenesis. While previous works have pointed out that PBHs can extend viable leptogenesis parameter space, in this talk I will discuss how PBHs may also rule out certain leptogenesis scenarios (and vice versa), by characterising the strong incompatibility between PBHs and the simple case of high-scale leptogenesis we study.

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