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Leptogenesis through Sterile Neutrino Oscillations in the Presence of Dark Higgs Bosons¹ JANE SCHLESINGER, INA FLOOD, RAFAEL PORTO, BRIAN SHUVE, MAXWELL THUM, Harvey Mudd College — We assess the viability of baryogenesis through right-handed neutrino (RHN) oscillation in models with a dark Higgs boson mediator between the RHNs and the Standard Model. The effects of the dark Higgs are examined both through the number of sterile neutrinos produced and their effect on asymmetry generation. For sufficiently strong couplings between the dark Higgs and either the Standard Model or the RHNs, the asymmetry generated by the time of the electroweak phase transition drops significantly because the RHNs come into equilibrium, violating the out-of-equilibrium condition of baryogenesis. Additionally, we find that time dependence of the dark Higgs abundance must be accounted for and has an effect on the number of RHNs and therefore the overall asymmetry generated. To this end, we systematically explore asymmetry generation as a function of the dark Higgs and RHN couplings.

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