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Placing Bounds on the Seesaw with Photons

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The Dimension-5 Seesaw Portal is a Type-I Seesaw model extended by $d = 5$ operators involving the sterile neutrino states, leading to new interactions between all neutrinos and the Standard Model neutral bosons. In this work we focus primarily on the implications of these new operators at the GeV-scale. We first revisit LEP constraints on the new interactions. Second, we turn to heavy neutrino pair production from Higgs decays, where the former are long-lived and disintegrate into a photon and a light neutrino. We perform a detailed recast of the search, which relies on the arrival time t_γ and pointing variable $|\Delta z_\gamma|$. Using Higgs production with an associated lepton, we place bounds on the effective operators.

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