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Radiative Higgs Lepton-Flavor-Violating Decay Mediated by Leptophlic Dark Matter

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In the standard model (SM), Higgs lepton-flavor-violating (LFV) decay is absent and thus it is a good probe to new physics. In this article we study a type of new physics that could lead to large Higgs LFV decay, i.e., leptophlic dark matter (DM) specified by the particle property of DM (a Majorana fermion) and DM-SM mediators (scalar leptons). Different than other similar setups, here we introduce both the left-handed and right-handed scalar leptons. They allow for large LFV in Higgs decay and thus may explain the tentative Br(h $ra\tau\mu$) $\sim 1\%$. In particular, we find that the stringent bound from τ
$ra\mu\gamma$ can be naturally avoided. Aspects of relic density and especially radiative direct detection of the leptonic DM are also investigated.

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