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LFV Higgs decays in low-scale seesaw models within the mass insertion approximation

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In this work we present a new computation of the lepton flavor violating (LFV) Higgs boson decays within the context of low-scale seesaw models, concretely the inverse seesaw model with three ν_R and three extra singlets X. The novelty of our computation is that it uses the mass insertion approximation (MIA) which works with the electroweak interaction states. This method also allows us to write the analytical results explicitly in terms of the most relevant model parameters, that are the neutrino Yukawa coupling matrix Y_ν and the right-handed mass matrix M_R, which is very convenient for a phenomenological analysis, and can be easily generalized to other low-scale seesaw models. We perform the calculation of the decay amplitude up to order $calO(Y_\nu^2 + Y_\nu^4)$ and study numerically the goodness of the MIA results. We also present the computation of the relevant one-loop effective vertex $H\ell_i\ell_j$ for the LFV Higgs decay which is derived from a large M_R mass expansion of the form factors, that can be of interest for other researchers who wish to estimate the $H \to \ell_i\bar{\ell}_j$ rates in a fast way in terms of their own preferred input values for the relevant model parameters Y_ν and M_R.

Presentation type

Parallel talk

Primary author: ARGANDA, Ernesto (IFLP - CONICET/UNLP)

Co-authors: HERRERO, maria (Universidad Autonoma de Madrid); MARCANO, Xabier (IFT-UAM/CSIC); Mr MORALES, Roberto (IFLP-CONICET/UNLP); Dr SZYNKMAN, Alejandro (IFLP-CONICET/UNLP)

Presenter: ARGANDA, Ernesto (IFLP - CONICET/UNLP)

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