

A Full EFT Approach to Radiative Neutrino Mass

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The standard model (SM) prediction of massless neutrinos is experimentally inconsistent. Introducing new high-energy physics allows for neutrino masses to be generated via effective operators in the SM. Naturally, the SM is therefore regarded as an effective field theory (EFT), namely the SMEFT, and calls for a complete EFT implementation of the new physics. This is especially poignant for so called ‘radiative’ mass modes that generate neutrino masses at 1-loop, where only a full EFT approach can account for the quantum effects in the parameters of the theory as we run from the new physics scale, down to the electroweak scale and below where measurements are made. In particular, I consider the matching of the Zee model to the SMEFT, through a 2-Higgs-Doublet model, carrying out the calculation at 1-loop, where the neutrino mass is generated. I include running and demonstrate the significance of the quantum corrections to the low-energy neutrino mass that arise in this full EFT approach.

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