



Contribution ID: 672

Type: Poster

# Complete one-loop matching of the type-I seesaw model onto the Standard Model effective field theory

*Friday, 8 July 2022 20:10 (20 minutes)*

In this paper, we accomplish the complete one-loop matching of the type-I seesaw model onto the Standard Model Effective Field Theory (SMEFT), by integrating out three heavy Majorana neutrinos with the functional approach. It turns out that only 31 dimension-six operators (barring flavor structures and Hermitian conjugates) in the Warsaw basis of the SMEFT can be obtained, and most of them appear at the one-loop level. The Wilson coefficients of these 31 dimension-six operators are computed up to  $\mathcal{O}(M^{-2})$  with  $M$  being the mass scale of heavy Majorana neutrinos. As the effects of heavy Majorana neutrinos are encoded in the Wilson coefficients of these higher-dimensional operators, a complete one-loop matching is useful to explore the low-energy phenomenological consequences of the type-I seesaw model. In addition, the threshold corrections to the couplings in the Standard Model and to the coefficient of the dimension-five operator are also discussed. The one-loop matching results of the type-II seesaw model are also briefly discussed.

Based on

- D. Zhang and S. Zhou, Complete one-loop matching of the type-I seesaw model onto the Standard Model effective field theory, JHEP 09 (2021), 163 [arXiv:2107.12133 [hep-ph]].
- X. Li, D. Zhang and S. Zhou, One-loop Matching of the Type-II Seesaw Model onto the Standard Model Effective Field Theory, [arXiv:2201.05082 [hep-ph]].

## In-person participation

No

**Primary authors:** ZHANG, Di (Institute of High Energy Physics, CAS); Prof. ZHOU, Shun

**Presenter:** ZHANG, Di (Institute of High Energy Physics, CAS)

**Session Classification:** Poster Session

**Track Classification:** Neutrino Physics