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Matching HEFT and SMEFT in double and triple Higgs production from weak boson fusion

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Abstract

In this work we study the matching between the two most popular effective field theories for beyond standard model Higgs physics, SMEFT and HEFT. To perform this matching we follow the approach of identifying the corresponding scattering amplitudes for physical processes in both theories, instead of the most usual approach of relating the corresponding effective Lagrangians or effective actions. In this work we focus on the physical processes of double and triple Higgs production from weak boson fusion, in particular, WW → HH, ZZ → HH, WW → HHH and ZZ → HHH.
We present here the analytical solution to this matching in terms of relations among the coefficients in both theories and comment on the most relevant phenomenological implications of such relations for collider physics.

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