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Electroweak resonances in HEFT

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Due to the gap between the known 100 GeV scale and new physics if any, it is natural to employ an effective one-loop Lagrangian (HEFT) for the particles of the Electroweak Symmetry Breaking Sector (WL,ZL and h). To describe any new particles and resonances that may be found at the LHC we employ its unitarized amplitudes, valid even in the presence of new strong interactions. We have assessed the systematics by comparing several such methods, and find that they give qualitatively similar results and succesfully produce unitary amplitudes in the nonperturbative regime. We are thus in a position to describe new physics in the 0.5 TeV-3 TeV (region of validity of our approximations: the effective theory and the equivalence theorem to substitute WL, ZL by the Goldstone bosons of electroweak symmetry breaking). We have also computed the coupling of the EWSBS to the top-antitop and two-photon channels to describe resonances that decay through them or to study their photon-photon production, for example. The approach is universal and useful for many BSM theories at low energy.

Experimental Collaboration

Primary authors: DOBADO, Antonio; Prof. LLANES-ESTRADA, Felipe J. (Universidad Complutense de Madrid)

Presenter: DOBADO, Antonio

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