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Resonances of the Electroweak Symmetry Breaking Sector in unitarized Higgs-EFT[1] FELIPE J. LLANES-ESTRADA, None, RAFAEL L. DELGADO, ANTONIO DOBADO, Univ Complutense Madrid — Because of the gap between the known 100 GeV scale and any new physics, it is natural to formulate an effective Lagrangian (HEFT) with the particles of the Electroweak Symmetry Breaking Sector (WL,ZL and h). To use it with any new particles and resonances that may be found at the LHC we extend it by means of dispersion relations that yield unitarized amplitudes valid even in the presence of new strong interactions. We have studied several such methods (Inverse Amplitude, N/D, Improved K-matrix, etc.) to assess the systematics, and find that they give qualitatively similar results and succesfully produce unitary amplitudes in the nonperturbative regime. We have computed all the necessary one-loop amplitudes in the HEFT and unitarized them numerically with those methods. 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.

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