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Strongly Interacting Electroweak Symmetry Breaking Sector with a Higgs-like light scalar

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The apparent finding of a 125-GeV light Higgs boson closes unitarity of the minimal Standard Model (SM), that is weakly interacting. This is an exceptional feature not generally true if new physics exists beyond the mass gap found at the LHC up to 700 GeV.

Such new physics induces departures of the low-energy dynamics for the minimal electroweak symmetry-breaking sector (EWSBS), with three Goldstone bosons (related to longitudinal W bosons) and one light scalar, from the SM couplings.

For most of parameter space, the scattering is strongly interacting (with the SM a remarkable exception). We therefore explore various unitarization methods, that can already be applied to the tree-level $W_L W_L$ amplitude; we find and study a natural second sigma-like scalar pole there.

Based on arXiv:1402.0666 [hep-ph], arXiv:1404.2866 [hep-ph] and arXiv:1408.1193 [hep-ph]

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