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Implications of Vector Boson Scattering Unitarity in Composite Higgs Models

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The strong nature of Composite Higgs models manifests at high energies through the growing behavior of the scattering amplitudes of longitudinally polarized weak bosons that leads to the formation of composite resonances as well as non resonant strong effects. In this work, the unitarity of these scattering amplitudes, computed on the framework of chiral perturbation theory, is used as tool to assess the profile of composite spectrum of the theory, including non-resonant behavior, vector resonances, and specially the CP-even scalar excitation, which is only poorly described by lattice calculations. These three signatures are then studied in realistic scattering processes at colliders, aiming to estimate the potential to exclude natural dynamically motivated scenarios of Composite Higgs models. This work is based on arXiv:1605.0136 and a follow up paper which will be submitted in the next weeks.

Experimental Collaboration

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