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Composite Higgs Dynamics on the Lattice

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We investigate the spectrum of the $SU(2)$ gauge theory with $N_f = 2$ flavors of fermions in the fundamental representation, in the continuum, using Lattice simulations.

This model provides a minimal template which has been used for different strongly coupled extensions of the Standard Model ranging from composite (Goldstone) Higgs models to intriguing types of dark matter candidates, such as the SIMPs.

Here we will focus on the composite Goldstone Higgs paradigm, for which this model provides a minimal UV complete realization in terms of a new strong sector with fermionic matter.

After introducing the relevant Lattice methods used in our simulations, we will discuss our numerical results.

We show that this model features a $SU(4)/Sp(4) \sim SO(6)/SO(5)$ flavor symmetry breaking pattern, as expected, and estimate the value of its chiral condensate.

Finally, we present our results for the mass spectrum of the lightest spin one and zero resonances, analogue to the QCD ρ , a_1 , σ , η' , a_0 resonances, which are relevant for searches of new, exotic resonances at the LHC.

Summary

Primary author: PICA, Claudio (University of Southern Denmark)

Co-authors: Mr HANSEN, Martin (CP3-Origins); Dr DRACH, Vincent (CERN); SANNINO, francesco (CP3-Origins)

Presenter: PICA, Claudio (University of Southern Denmark)

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