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Composite (Goldstone) Higgs Dynamics on the Lattice: Spectrum of $SU(2)$ Gauge Theory with two Fundamental Fermions

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We study the meson spectrum of $SU(2)$ gauge theory with two Wilson fermions in the fundamental representation. The theory unifies both Technicolor and composite pseudo Goldstone Boson (pGB) Higgs models of electroweak symmetry breaking. We have calculated the masses of the lightest spin one vector and axial vector mesons. In addition, we have also obtained preliminary results for the mass of the lightest scalar (singlet) meson state. The simulations have been done with multiple masses and two different lattice spacings for chiral and continuum extrapolations. The spin one meson masses set lower limits for accelerator experiments, whereas the scalar meson will mix with a pGB of the theory and produce two scalar states. The lighter of the states is the 125 GeV Higgs boson, and the heavier would be a new yet unobserved scalar state.

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