

Non-perturbative generation of elementary fermion mass: a numerical study

Monday, July 23, 2018 3:00 PM (20 minutes)

In this talk we present a numerical lattice study of a $SU(3)$ gauge model where a $SU(2)$ doublet of non-Abelian strongly interacting fermions is coupled to a complex scalar field doublet via a Yukawa and a Wilson-like term. Despite the presence of these two chiral breaking operators in the Lagrangian, the model enjoys an exact symmetry, acting on all fields, which prevents UV power divergent fermion mass corrections. In the phase where the scalar potential is non-degenerate and fermions are massless the bare Yukawa coupling can be set at a critical value at which chiral fermion transformations become symmetries of the theory. Numerical simulations in the Nambu-Goldstone phase of the critical theory, for which the renormalized Yukawa coupling by construction vanishes, give evidence for non-perturbative generation of a UV finite fermion mass term in the low energy effective action.

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