



Contribution ID : 155

Type : Parallel

Testing a non-perturbative mechanism for elementary fermion mass generation: lattice setup.

Monday, 19 June 2017 14:30 (0:20)

Content

In this contribution we lay down a lattice setup that allows for the non-perturbative study of a field theoretical model where a $SU(2)$ fermion doublet, subjected to non-Abelian gauge interactions, is also coupled to a complex scalar field doublet via a Yukawa and an “irrelevant” Wilson-like term. Using naive fermions in quenched approximation and based on the renormalized Ward identities induced by purely fermionic chiral transformations, lattice observables are discussed that enable: a) in the Wigner phase, the determinations of the critical Yukawa coupling value where the purely fermionic chiral transformation become a symmetry up to lattice artifact; b) in the Nambu-Goldstone phase of the resulting critical theory, a stringent test of the actual generation of a fermion mass term of non-perturbative origin. A soft twisted fermion mass term is introduced to circumvent the problem of exceptional configurations.

Preferred track (if multiple tracks have been selected)

None

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Session Classification : Physics Beyond the Standard Model

Track Classification : Physics Beyond the Standard Model