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Toward the spectrum of the SU(2) adjoint Higgs model

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Higgs particles in the adjoint representation of a non-Abelian gauge theory play an important role in many scenarios beyond the standard model, especially grand-unified theories, partial compositness models, and (broken) supersymmetric theories. However, recently new analytic results based on gauge-invariant perturbation theory have arisen, which require a reevaluation of the observable, physical spectrum of such theories. Lattice methods can be used to determine this spectrum, and test the underlying predictions. To this end, an SU(2) gauge theory with a single adjoint Higgs is simulated. This model, in the Brout-Englert-Higgs phase, has an unbroken U(1) subgroup. It is then expected a massless vector state. This model can then be a well defined way to obtain a low energy QED from a GUT that comprehends it.

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