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## Massless composite vector particles

Brout-Englert-Higgs physics is an integral part of many BSM scenarios, such as grand-unified theories, partial compositeness models and (broken) supersymmetric theories. Recent analytic results, based on manifest gauge invariance, suggest that in these models one has to reconsider setting the physical spectrum equal to the elementary one.

We illustrate this by considering a toy model for different BSM theories, an  $SU(2)$  gauge theory coupled to a single adjoint Higgs. Such a sector plays a role, e.g., in the emergence of QED in GUTs.

It is predicted that, even at weak coupling, such model exhibits a massless composite vector state, as well as massive composite vector states which differ from the elementary ones. We provide support for these predictions using lattice gauge theory.

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