

A reappraisal of top-partner hunting

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Composite Higgs models together with partial compositeness predict the existence of vector-like top-partners above the TeV scale. A wide class of such models show significant branching ratio of the top-partners decaying into the third generation quarks and exotic pseudo Goldstone bosons, thus opening up new search topologies at the LHC. We systematically study the exotic decays of the top-partners in the partial compositeness framework. We aim to bridge the gap between the simplified phenomenological models and the full composite Higgs machinery motivated from a 4D strongly coupled gauge theory. We present a Lagrangian at the TeV scale and identify a number of universal features, in particular regarding the spectra of the top-partners. Finally as a proof of principle we discuss the exotic decays of the top-partners in the $SU(5)/SO(5)$ coset.

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