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Signatures of composite right-handed singlets in gauge-Higgs unification models

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We investigate various scenarios of fermion mass generation in $SO(5) \times U(1)$ models of gauge-Higgs unification, where the Higgs field is a composite Goldstone boson of a new strong sector. If the top quark is the main driving force of EWSB, the parameters of the $(t, b)_L$ doublet are strongly constrained by Z pole observables. The hierarchical mass ratio between the top and bottom quark implies that the b_R must be strongly composite. While a composite b_R is consistent with current experimental limits, it leads to sizable coupling deviations that can be probed by future accelerators such as ILC. The lepton sector has more freedom in model-building, but the most minimal setup again suggests that right-handed singlets are composite fermions. We consider different quantum number assignments for leptons and study the signatures of the reaction $e^+e^- \rightarrow l^+l^-$ to distinguish them.

Summary

Primary author: YOON, Jong Min (SLAC / Stanford University)

Co-author: PESKIN, Michael

Presenter: YOON, Jong Min (SLAC / Stanford University)

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