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# Spin-One Top Partner: Phenomenology

Cai, Cheng, and Terning (CCT) suggested a model in which the left-handed top quark is identified with a gaugino of an extended gauge group, and its superpartner is a spin-1 particle. We perform a phenomenological analysis of this model, with a focus on the spin-1 top partner, which we dub the **swan**. We find that precision electroweak fits, together with direct searches for $Z'$ bosons at the LHC, place a lower bound of at least about 4.5 TeV on the swan mass. An even stronger bound, 10 TeV or above, applies in most of the parameter space, mainly due to the fact that the swan is typically predicted to be significantly heavier than the $Z'$. We find that the 125 GeV Higgs can be easily accommodated in this model with non-decoupling D-terms. In spite of the strong lower bound on the swan mass, we find that corrections to Higgs couplings to photons and gluons induced by swan loops are potentially observable at future Higgs factories. We also briefly discuss the prospects for discovering a
swan at the proposed 100 TeV $pp$ collider.

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