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A Search for Gluino-Mediated Supersymmetry with Higgs Bosons and Missing Energy in the Final State

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In supersymmetric extensions of the Standard Model, the Higgsino and gluino are expected to play an important role in stabilizing the Higgs boson mass parameter. With specific assumptions about the LSP and NLSP masses, CMS results at 8 TeV for gluino-mediated supersymmetry with two Higgs bosons and missing energy in the final state have set a lower bound on the gluino mass at approximately 1 TeV; similar searches at 13 TeV bring this bound to about 1.5 TeV. Here we will focus on certain classes of models in which the sparticle mass spectra result in events with highly boosted Higgs bosons. A new analysis strategy using jet substructure techniques in hopes of enhancing sensitivity to these types of models will be presented. Our expected sensitivity with the new techniques will be compared to existing search strategies in the multijet and missing energy final states.

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