

Abstract Submitted  
for the APR17 Meeting of  
The American Physical Society

**Optimization of a search for top squark decays to a b-quark and a chargino in final states with one lepton in  $pp$  collisions at  $\sqrt{s} = 13$  TeV with the ATLAS detector** JAMES SHEPLOCK, University of Pennsylvania, ATLAS COLLABORATION — We present the results of an optimization study for a top squark search signal region. The scenario studied is the decay to a b-quark and a chargino, with compressed chargino and neutralino mass splitting. This compressed scenario leads to an off-shell  $W$ -boson, which produces a low-energy final state lepton. For high top squark masses, the final state has a high-energy b-jet and large missing transverse energy. Using this signature, we optimize the signal region for discrimination against the Standard Model background across a range of signal mass points.

James Sheplock  
University of Pennsylvania

Date submitted: 28 Sep 2016

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