Abstract Submitted
for the TSS17 Meeting of
The American Physical Society

Distinguishing Standard Model Extensions using Monotop Chirality IAN TAULLI, TERUKI KAMON, RYAN MUELLER, Texas AM University — Many theories beyond the standard model of particle physics may produce top quarks with a specific chirality, either left-handed (LH) or right-handedness (RH). The handedness can be reflected in several kinematical distributions of the decay products of the top quark. We suggest a ratio of the bottom-quark energy to the top-quark energy, to examine the chirality. Monte Carlo simulations were performed to evaluate what would happen at the LHC if there exists a heavy color-triplet scalar mediator that decays into either a LH or RH top quark along with a dark matter particle. In the hadronic decay mode of the top quark, followed by hadronic decays of the simulation shows that the handedness of the model can be discerned to a high degree of accuracy by studying the shape of the distribution. If new models of particle physics preferentially produce a top quark of a specific chirality then they can be investigated at the LHC, providing a robust test of the standard model.

Ian Taulli
Texas A
M University

Date submitted: 28 Feb 2017 Electronic form version 1.4