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Searches for Micro Black Holes and String Balls with the ATLAS Detector During Run 1

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Models postulating extra spatial dimensions, in which only the gravitational field propagates, address the long-standing hierarchy between the electroweak scale and the gravitational (Planck) scale. Most of these models allow the production of non-perturbative gravitational states, such as micro black holes and string balls, at Large Hadron Collider collision energies. Searches for such states are presented in a variety of final states that include high transverse momentum jets and/or leptons, using 20.3 fb^{-1} of proton-proton collision data recorded by the ATLAS detector at $\sqrt{s}=8 \text{ TeV}$. No excess of events beyond Standard Model expectations is observed in any of the channels and upper limits on the visible cross-sections for non-Standard Model production are set for final states with large scalar sum of jet and lepton transverse momenta. Using a wide variety of models for black hole and string ball production and decay, exclusion contours are determined as a function of the production mass threshold and the fundamental gravitational scale.

Oral or Poster Presentation

Oral

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