



PHYSICS AND ASTRONOMY SEMINAR

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“Searching for SUSY with ATLAS, and Beyond with MilliQan”

Abstract

At the halfway point of Run 2 at the LHC, supersymmetry still stands as an attractive solution to the hierarchy problem and other open questions in particle physics. Models featuring strongly interacting supersymmetric particles— gluinos and squarks— are particularly compelling at Run 2 of the LHC, where the increased center-of-mass energy leads to dramatically improved sensitivity. The results of ATLAS’s broad program of SUSY searches is presented, with a particular focus on searches for models with gluinos and light third-generation superpartners using jet substructure. With no strong signals present in the data, limits are set in a variety of models covering a huge range of experimental signatures.

With no signals of new physics emerging from the current data, now is an opportune moment to consider signatures that our detectors could be missing. For example, classes of models with a “dark” $U(1)$ field predict particles with "milli-charge" coupling which would be missed by the high thresholds of the LHC detectors. A new detector, called MilliQan, is being designed to search for these particles and other long-lived particle signatures. Results from a demonstrator system currently operating and recording collisions at the LHC are discussed, as well as prospects for the full detector during Runs 3 and 4.

Monday, November 6, 2017

2:00 p.m.

Human & Social Development Building
Room A264