

**Stony Brook University
The Graduate School**

Doctoral Defense Announcement

Abstract

Dijet Angular Decorrelation with the ATLAS Detector at the LHC

By

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The Large Hadron Collider at CERN is a proton-proton collider where gluon-gluon interactions dominate. Many of the hadron collider's signatures for Standard Model processes and for physics beyond the Standard Model involve gluons in the initial state. It is important then that the gluon evolution be well understood. The angular decorrelation between the two highest momentum jets in an event can be used to study the dynamics of multi-jet events and the transition from DGLAP to BFKL evolution. The differential cross-section has been measured as a function of the opening angle in ϕ and the opening angle in y between the two highest momentum jets in an event, using $\int L=36\text{pb}^{-1}$ of proton-proton collisions collected by the ATLAS detector in 2010. The resulting cross-section has been compared with predictions for several Monte Carlo generators and NLO calculation. The second-leading jet was required to have a transverse momentum greater than 80 GeV with the leading most jet bounded by transverse momentum regions where the lowest $p_T>110$ GeV and the highest $p_T>800$ GeV. All jets were required to be within $|y|<2.8$ to be considered.

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