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## Low energy observables and exclusive production with the ATLAS Detector

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Low energy phenomena have been studied in detail at the LHC, providing important input for improving models of non-perturbative QCD effects. The ATLAS collaboration has performed several new measurements in this sector:

We present charged-particle distributions sensitive to the underlying event, measured by the ATLAS detector in proton-proton collisions at a centre-of-mass energy of 13 TeV. The results are corrected for detector effects and compared to predictions from various Monte Carlo generators.

In addition, we present studies on the correlated hadron production, as they are an important source for information on the early stages of hadron formation. In particular, an analysis of the momentum difference between charged hadrons in high-energy proton-proton collisions is performed in order to study coherent particle production. The results are compared to the predictions of a helical QCD string fragmenting model.

In the absence of forward proton tagging, exclusive processes can be distinguished in the central part of the ATLAS detector exploiting the absence of charged particles reconstructed in the inner tracking detector. We present a first measurement of the exclusive two-photon production of muon pairs in proton-proton collisions at a center-of-mass energy of 13 TeV. The results show significant deviations from the pure QED prediction, which can be explained by proton-proton rescattering effects.

### Experimental Collaboration

ATLAS

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