



Contribution ID : 558

Type : **Oral presentation**

Study of additional radiation in top pair events using the ATLAS detector at the LHC

Thursday, 3 July 2014 12:00 (13)

The large centre-of-mass energy available at the proton-proton collider LHC allows for the copious production of top quark pairs in association with other final state particles at high transverse momentum. The ATLAS experiment has measured several final state observables that are sensitive to additional parton radiation in top anti-top quark final states. Examples are the multiplicity of jets for various transverse momentum thresholds or the probability to emit jets above a given threshold in a fixed rapidity region. These measurements are compared to modern Monte Carlo generators based on NLO QCD matrix element or LO multi-leg matrix elements. The data are able to constrain the uncertainty on the modelling of the top pair production mechanism. We also discuss top production in association with photons and Z bosons. In addition, the production of top quark pairs in association with heavy quarks (beauty and charm) is presented.

Summary

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Session Classification : Top-quark and ElectroWeak Physics

Track Classification : Top-quark and ElectroWeak Physics