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Hadronically decaying massive particles, jet substructure, and measurement of the transverse momentum of the Z boson at LH

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The identification and study of jets originated from the hadronic decays of massive particles, like vector bosons or top quark provide a direct test of QCD calculations of gluon and quark radiation and validate novel techniques of jet shapes and jet substructure for reducing the sensitivity to soft QCD and to multiple proton-proton collisions. The measurement of the cross-section of high transverse momentum Z->bbbar production in proton-proton collisions at sqrt{s}=8 TeV at LHC is presented and compared to next-to-leading order predictions. In addition, a measurement of jet shapes in t-tbar final states using data recorded at LHC in presented. Samples of events with top-quark pairs are selected and the differential and integrated shapes of the b-quark jets resulting from the top-quark decays are compared with those of the light-quark jets from the hadronic W-boson decays W -> q¯q' in the semileptonic channel.

The measurement of the transverse momentum of the Z boson performed at LHC is reported for sqrt{s) = 7 TeV. The measurement is sensitive to soft resummation effects for small momentum transfers and to multiple hard jet emissions for large momentum transfers, probing QCD in a unique way. The data are used to tune next-to-leading order plus parton shower Monte Carlo simulations.

Summary

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