

## Study of multi-muon events produced in ppbar collisions with CDF

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We report a study of multi-muon events produced at the Fermilab Tevatron collider and recorded by the CDF II detector. In a data set acquired with a dedicated dimuon trigger and corresponding to an integrated luminosity of  $2100\text{pb}^{-1}$ , we isolate a significant sample of events in which at least one of the muon candidates is produced outside of the beam pipe of radius of 1.5 cm. The production cross section and kinematics of events in which both muon candidates are produced inside the beam pipe are successfully modeled by known QCD processes which include heavy flavor production. In contrast, we are presently unable to fully account for the number and properties of the remaining events, in which at least one muon candidate is produced outside of the beam pipe, in the terms of the same understanding of the CDF II detector, trigger, and event reconstruction. Several topological and kinematic properties of these events are presented. The events offer a plausible resolution to long-standing inconsistencies related to b-bbar production and decay.

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