Muons in minimum-bias events at 7 TeV in CMS: data-MC comparisons for a few basic kinematic distributions

Presented for approval on 9 June 2010
(http://indico.cern.ch/conferenceDisplay.py?confId=81388)

Updated 19 July 2010

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Two types of muon candidates:
- Tracker muons: tracker tracks matched to least one segment in the muon system.
- Global muons: combined fit of all tracker and muon hits (higher $p_T$ cutoff).

- Mostly low-$p_T$ muons from decays of light hadrons (MC prediction shown in red).
- Pseudorapidity distribution peaks in the forward region because of a lower $p_T$ threshold to reach muon stations.
- Good agreement with MC prediction including heavy-flavor (b- and c-quark) decays (cyan), hadron punch-through (black), and mistags due to accidental matches of non-muon tracks with segments in the muon chambers produced by muons (green).
Tracker Muons

Global Muons

CMS Preliminary
\(\sqrt{s} = 7\) TeV

Data, 0.47 nb
- muons from heavy flavours
- muons from light hadrons
- duplicates
- hadron punch-through

\(q \times p_T\) (GeV/c)
Tracker Muons

Global Muons