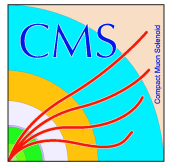

Status of Muon Jets Analysis

Jim Pivarski

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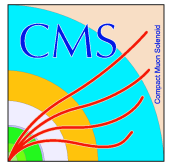
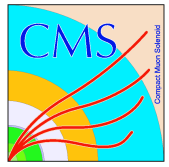
28 June, 2010

In a nutshell



- Target signal: new low-mass high-momentum dimuon resonances motivated by possible "Pamela dark matter signal" and Higgs hidden by NMSSM
- Signal topology: nearby groups ("jets") of muons
  - with many muons per group ("property A"), *or*
  - more than one group per event ("property B"; NMSSM), *or*
  - correlated with missing energy ("property C"), *or*
  - with a displaced vertex ("property D")
- Initial exploration and quick background study is done (motivated the above), now I'm working on complete baseline studies of all of the above
- Generated signals (NMSSM Higgs, sample dark matter model, muon-jet guns) on CASTOR
- Acquiring major background samples (min-bias, di-taus?) from CRAB
- 99% of software is ready; a lot will get finished all at once (with possibly another round of signal/background acquisitions)

Studies (incomplete?)



- Efficiency and backgrounds of muon jets constructed from
  - trackerMuons (high backgrounds)
  - trackerMuons with optimized arbitration (an algorithm I'm developing to eliminate backgrounds from 1 muon reconstructed as 2)
  - trackerMuons made with "conversion-finding 7-iteration tracking" (for highly displaced verticies)
  - standAloneMuons, globalMuons (inefficient when muons cross paths in the chambers)
  - standAloneMuons from the new "SET" algorithm (does it have the same inefficiency?)
  - standard Muon-POG mix of globalMuons + trackerMuons + standAloneMuons (standard, but hard to pick apart)
- As a function of
  - invariant mass, momentum, displaced vertex
  - propagation into muon system
  - 3-D fit of m_{12}, m_{34}, m_{1234} (NMSSM)
- With muon-group isolation (several different definitions)...