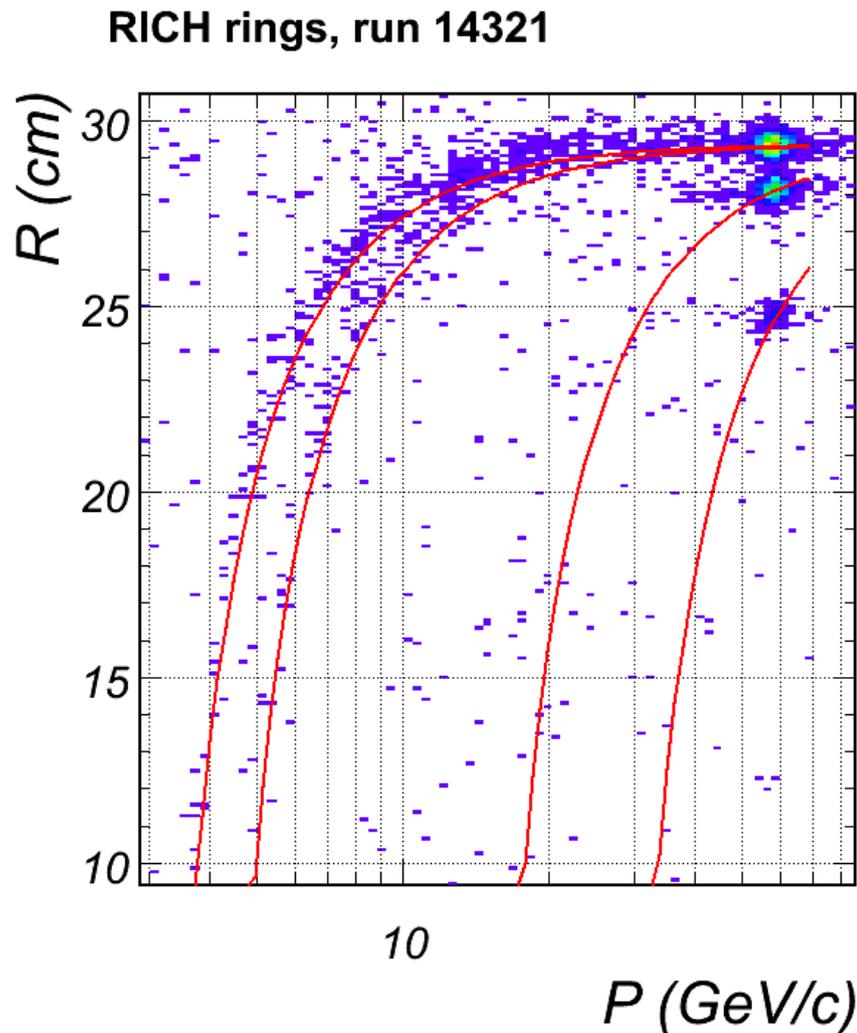


MUONS

# ~~Motorcycles~~ Are Everywhere

Andre Lebedev  
MIPP Software Meeting  
March 8, 2007

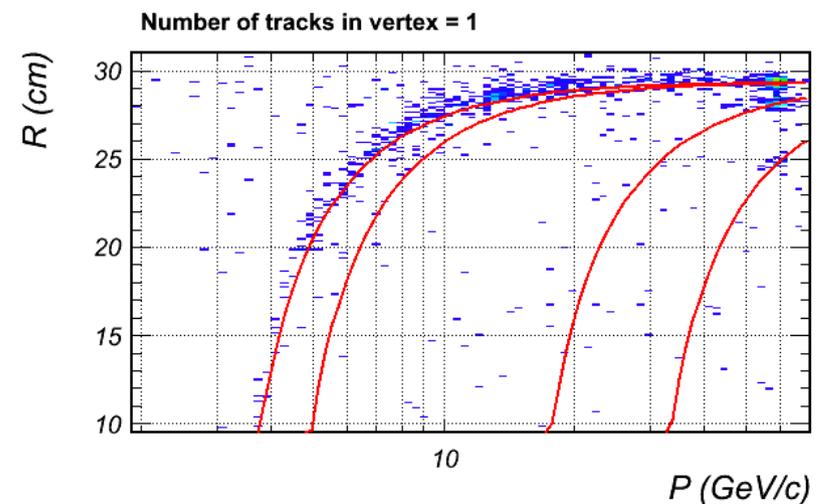
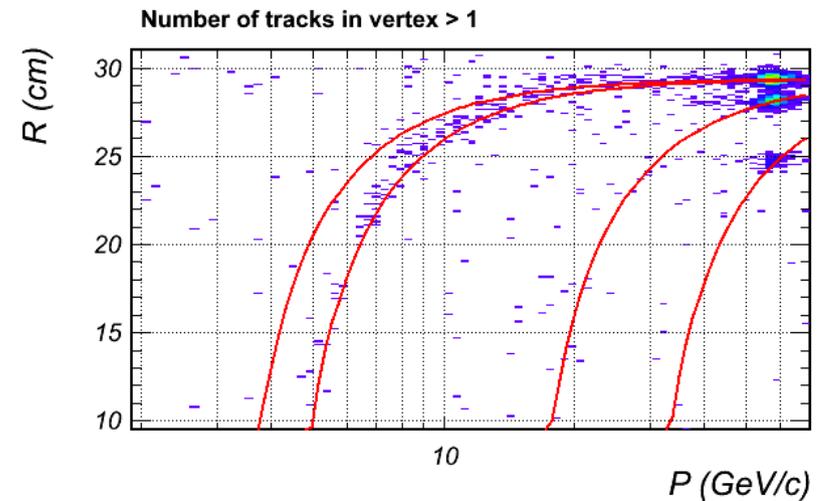
$$\pi^-/K^-/p^- + \text{Bi} \rightarrow \mu^- + X$$



- When I first looked at the distribution of ring radii vs momentum, I was stunned
- What is so special about bismuth?
- Or is it the -58 GeV/c momentum?

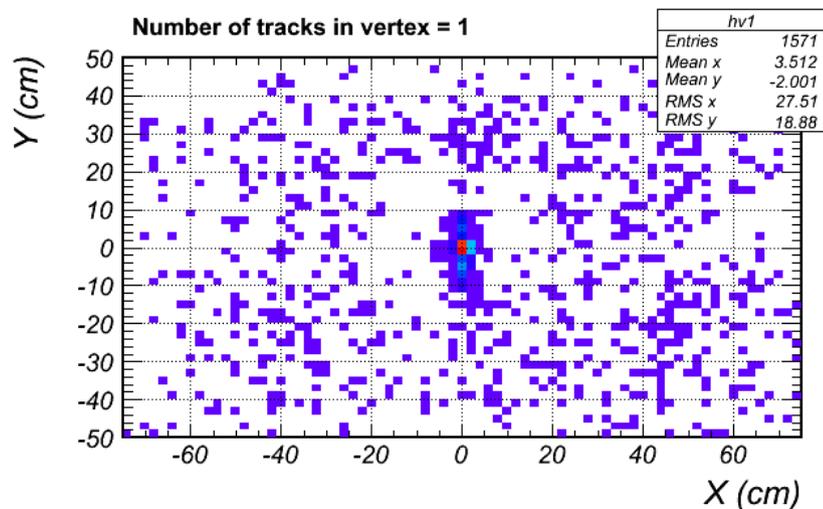
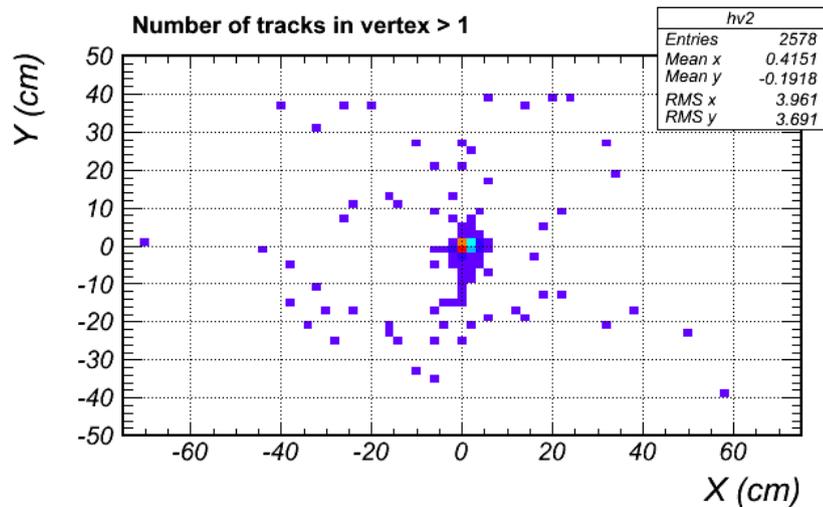
# Oh, they are not Produced on Bi...

- Unfortunately, we did not discover a magic Bi target that makes muons by the bucket
  - They don't come from real vertices
- But boy, are they plentiful



# Where do they come from?

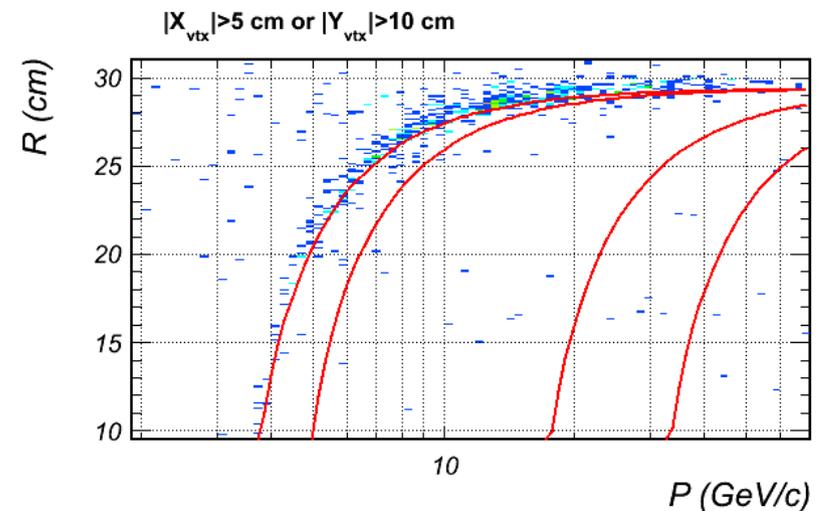
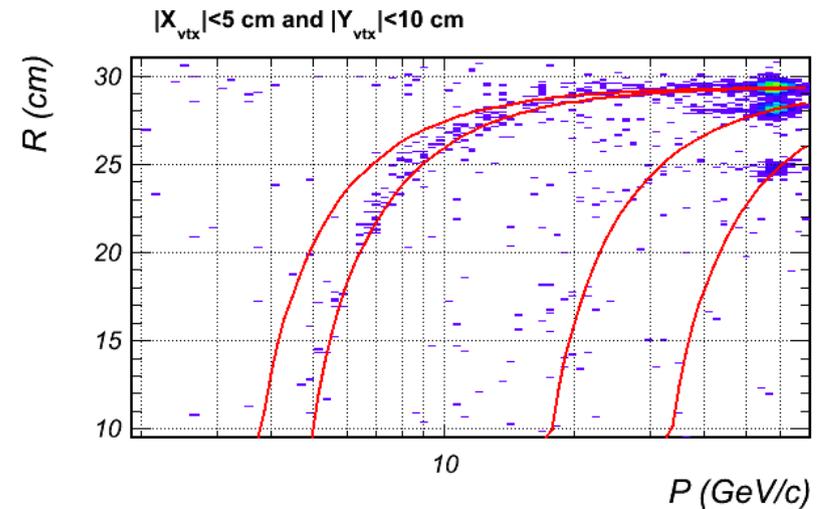
(rhetorical question)



- Just as one might expect, muons do not come from the target
- They create a significant halo in this particular run
  - Dated May 22, 2005, so it has the better beam conditions

# It's Easy to Remove Them

- Requiring that the track comes from near the target in  $(x,y)$  removes pretty much all muons
- The lower histogram contains 637 entries
  - The run had 2829 beam triggers, so 22% of events have company



# Summary

- Secondary beam runs may have a significant muon halo
  - Note: the RICH will only pick up in-time tracks!!!
- Most muons are removed by a simple cut
  - Probably will not have a huge effect on analyses
- People working with this data should be aware of the problem
  - Muon halo should be added into MC at the right level