RICH Reconstruction Progress

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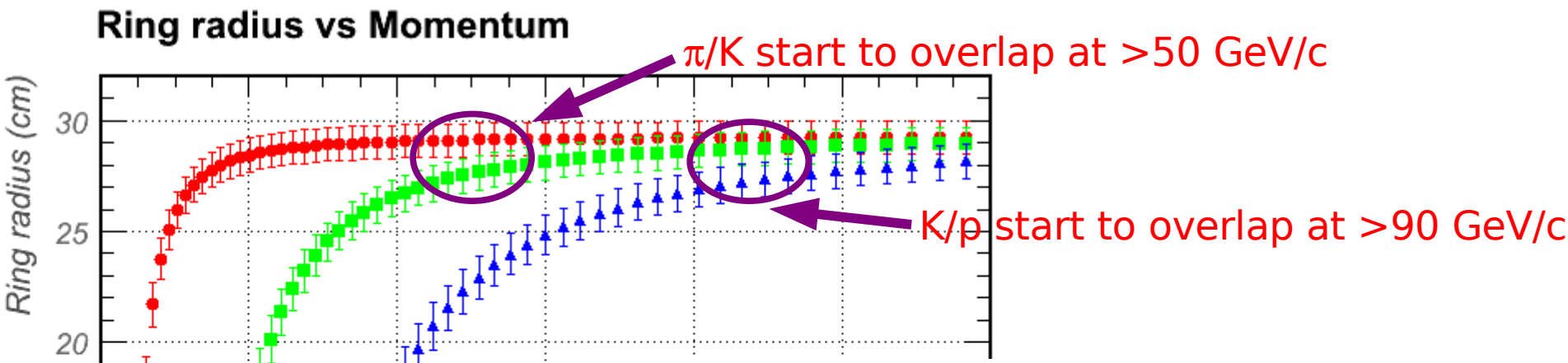
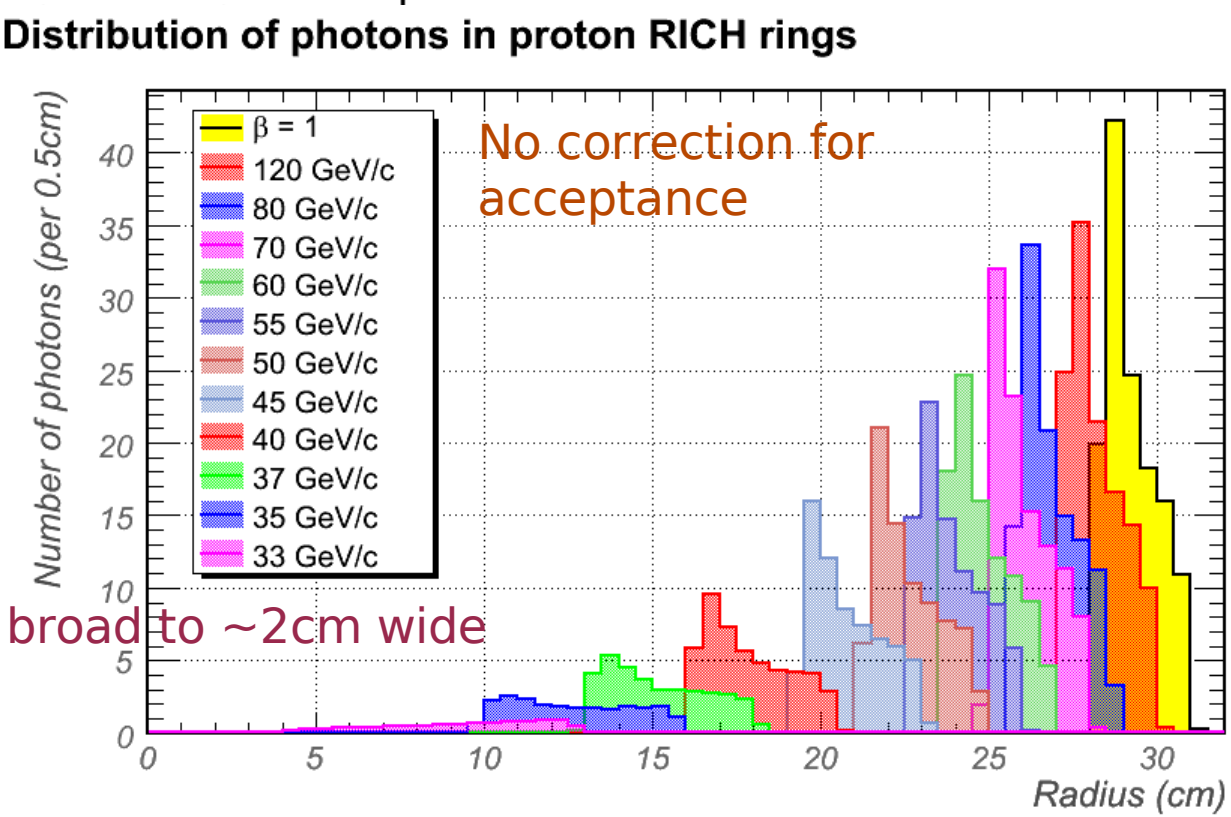
Overall Strategy (not new)

- Get a track going through the RICH radiator volume
- Reflect the track off the mirror array to find the ring center on PMT array
- Calculate the likelihood of electron, muon, pion, kaon, and proton hypotheses
  - Need for analysis
- Compute ring radius
  - Need for PR, sanity check, and K mass measurement

π/K/p PID capability



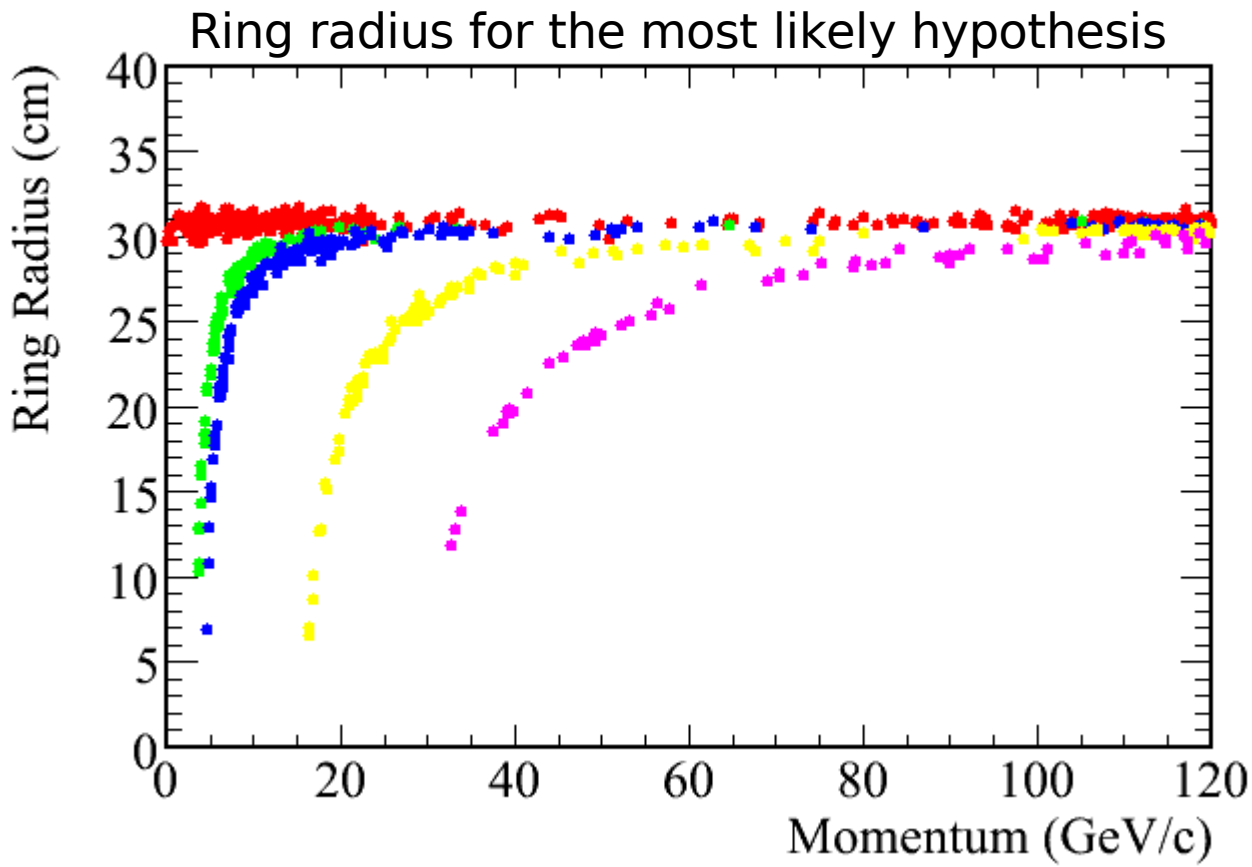


Rings go from very broad to ~2cm wide

Where we are

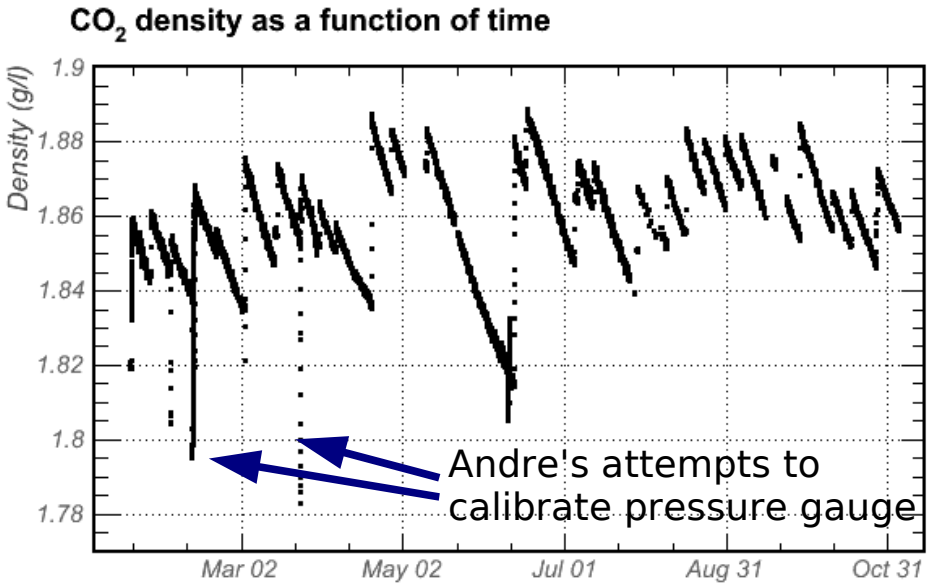
- SPFit tracks and rings match to 5mm
- Two ways of getting PID:

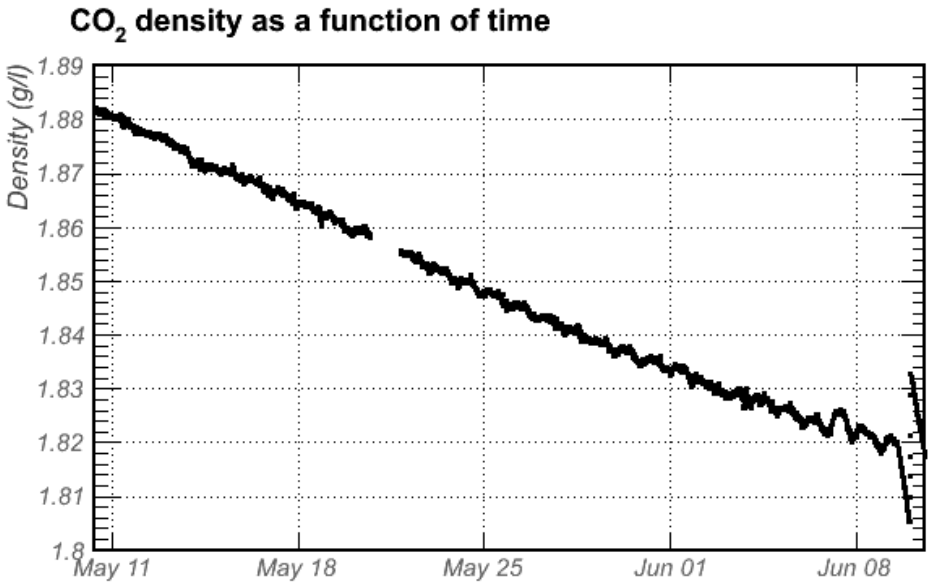
Likelihood based on RICHRadFit (Mark)
Likelihood based on particle hypotheses (Sharon)



Calibration

- Nick Graf started RIRich class to get pressure and temperature for a given run
  - Both vary sufficiently slowly that one value per run should be ok
- Need to make sure pressure and temperature are calibrated





What to do at IU

- Verify that we understand ring radii vs density
  - Changes to (n-1) are ~4% (5mm in β=1 ring radius), so I bet we can see them
- Use realistic photon distribution in calculation of hypothesis likelihood
- Provide a sample of known pions to threshold Cherenkov
- Use beam tracks to measure beam PID purity
- (For later) Measure PID purity with MC