Correlation between variables

Procedure

- It was suggested, to look at the $\mu$ and $\sigma$ of the $\Delta \theta(\phi)$ distributions in different pairings of the bin variables.
- Basically look at the $\Delta \theta(\phi)$ profile histograms in 2-dimensions: mtm vs. $\cos(\theta)$, $\cos(\theta)$ vs. $\psi$ and mtm vs. $\psi$.
- Enables us to see the correlation between various variables and to decide the no of bins to be considered for the study.
mtm vs. cos(θ)

Profile of Δθ vs mtm and cos(θ) for e^+

Profile of Δθ vs mtm and cos(θ) for e^−

Track Match Study

Gagan Mohanty
Profile of $\Delta \phi$ vs mtm and $\cos(\theta)$ for $e^+$

Profile of $\Delta \phi$ vs mtm and $\cos(\theta)$ for $e^-$
$\cos(\theta) \text{ vs. } \psi$

Profile of $\Delta \theta$ vs $\cos(\theta)$ and $\psi$ for $e^+$

Profile of $\Delta \theta$ vs $\cos(\theta)$ and $\psi$ for $e^-$

Track Match Study

Gagan Mohanty
mtm vs. \cos(\theta)

Profile of $\Delta \phi$ vs \cos(\theta) and $\psi$ for e$^+$

Profile of $\Delta \phi$ vs \cos(\theta) and $\psi$ for e$^-$

Track Match Study

Gagan Mohanty
Profile of $\Delta\theta$ vs mtm and $\psi$ for $e^+$ and $e^-$

Track Match Study

Gagan Mohanty
mtm vs. \cos(\theta)

Profile of $\Delta \phi$ vs mtm and $\psi$ for $e^+$

Profile of $\Delta \phi$ vs mtm and $\psi$ for $e$

Track Match Study

Gagan Mohanty
Correlation between variables

- Go for some crude binnings in $\psi$ in addition to the usual binnings on mtm and $\cos(\theta)$:
  
  - low, $\psi < 0.2 \text{ rad}$,
  - intermediate, $0.2 \leq \psi < 0.4 \text{ rad}$
  - high $\psi \geq 0.4 \text{ rad}$

- Hard to estimate potential improvements on the track-match performance at this stage, however, expect it to take care of tracks not originating from the IP

- Although this would make the track-matching code little bit slower, I believe it worthwhile to live with that
Moving toward CM2 data

- Found out a problem with the EmcTrkInterInfo point radius: (see my recent posting to the recoCalor hypernews)
- This has been fixed (to an approximation) in the very recent release, 14.4.0a (not yet committed)
- Plan to run through full Run1-3 CM2 converted data that would ensure having enough statistics with the extra bin-nings we are introducing