$\bar{p}\,p \rightarrow e^+e^-\,\pi^\circ$ with PandaRoot

(Ronald Kunne 17/5/11)

- Goal : studying electrons, gammas and π°'s
- Moments, probabilities

- TPC
- P_{beam} = 4 GeV/c
- Version : 11803 (5/5/11)
- externals: january 2010

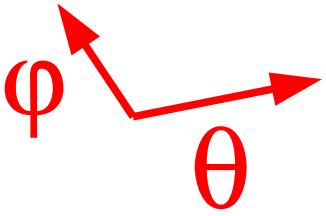
Exploration : gammas and π°'s

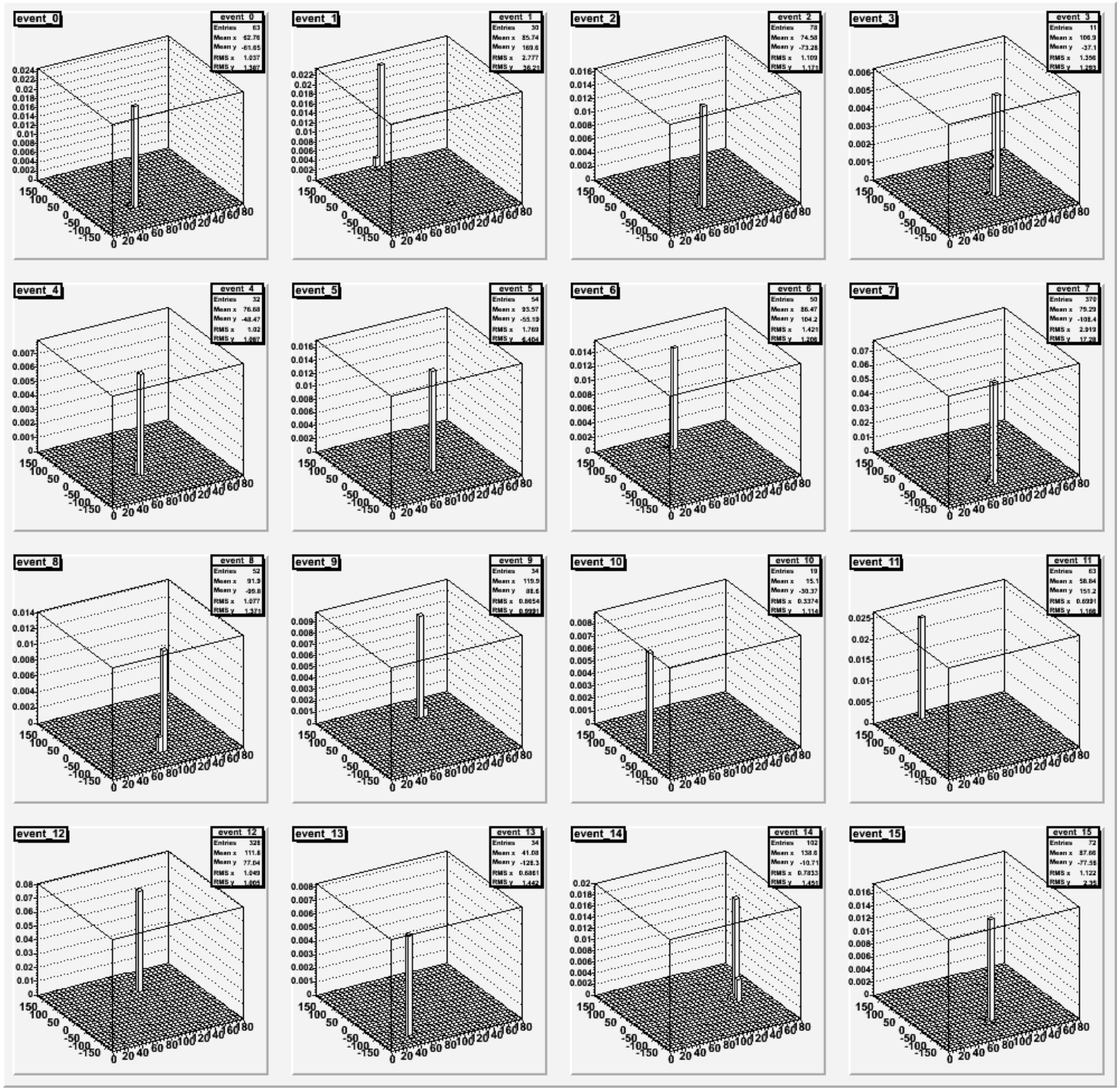
- 1000 ″tracks″ each with pgun

- 0.2 < p < 10 GeV/c
- 5º < θ < 140º
- -180º < φ < -180º

Some events

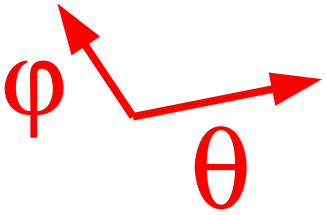
γ

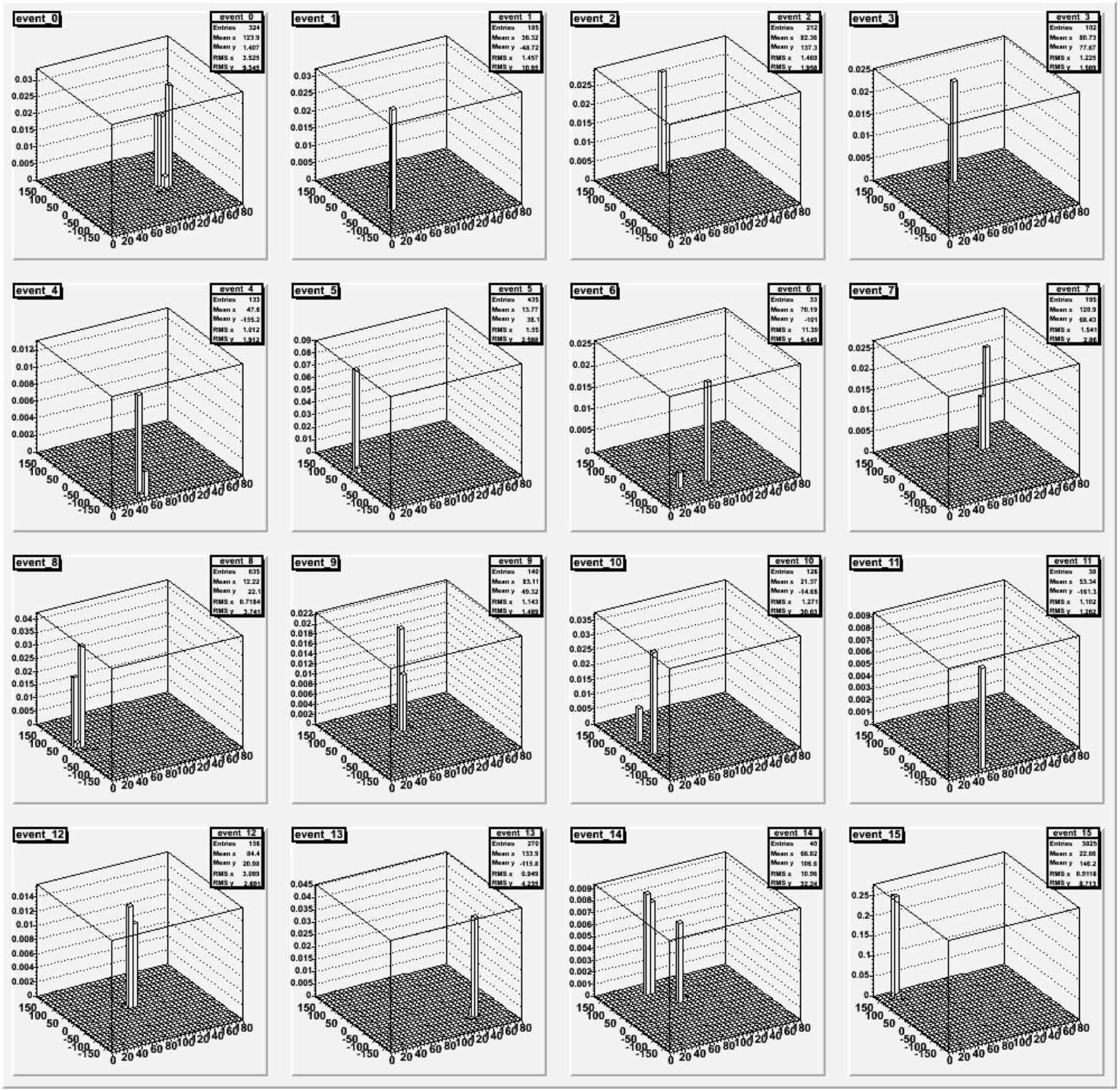




Some events

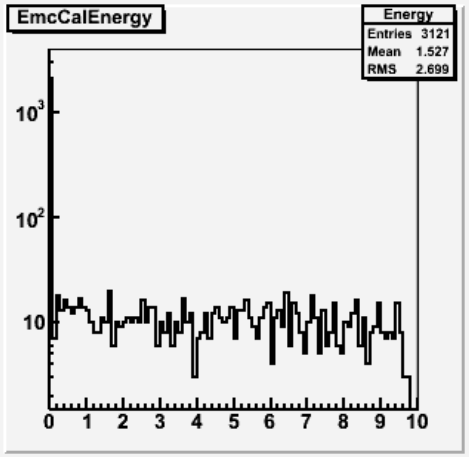
π°

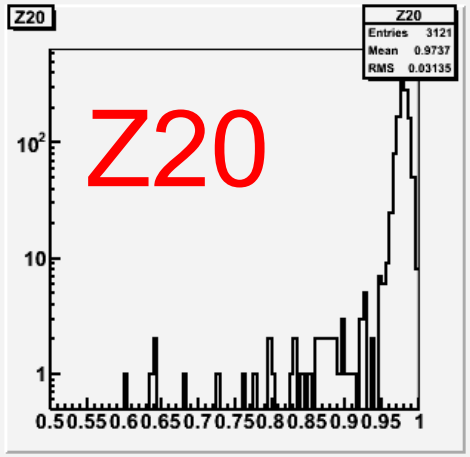


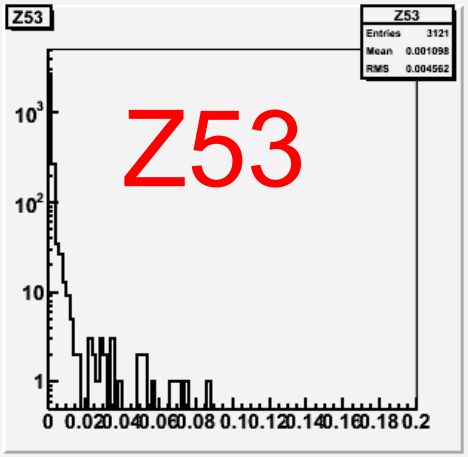


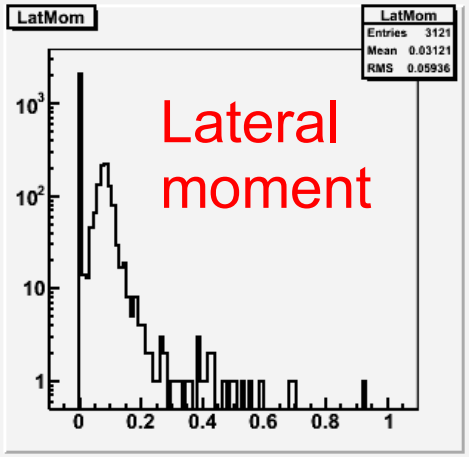
Moments

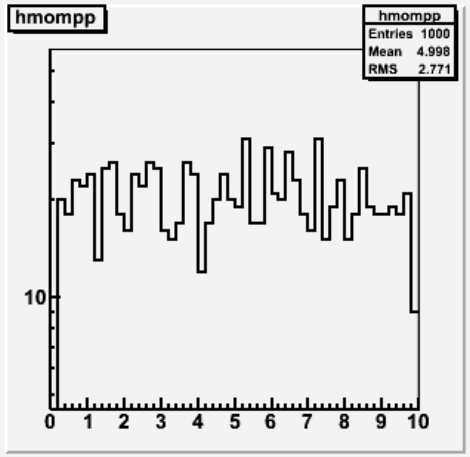
γ

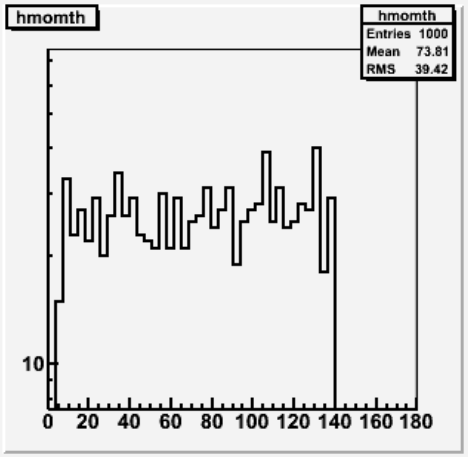


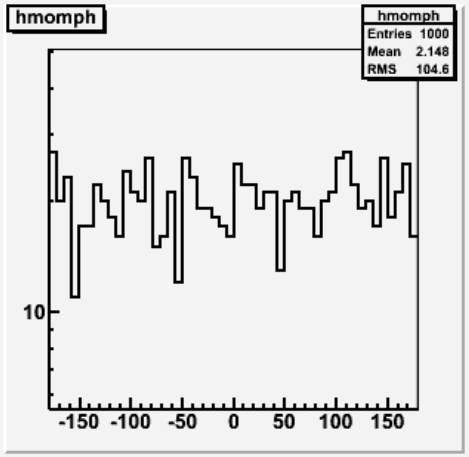


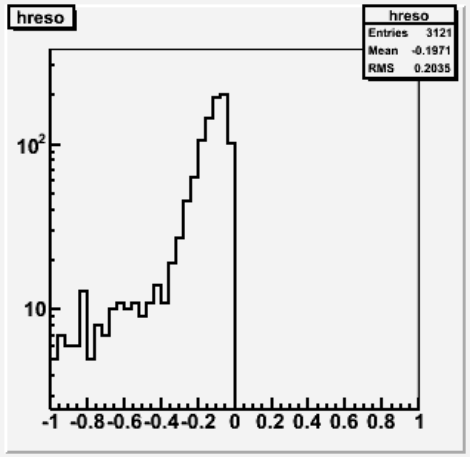








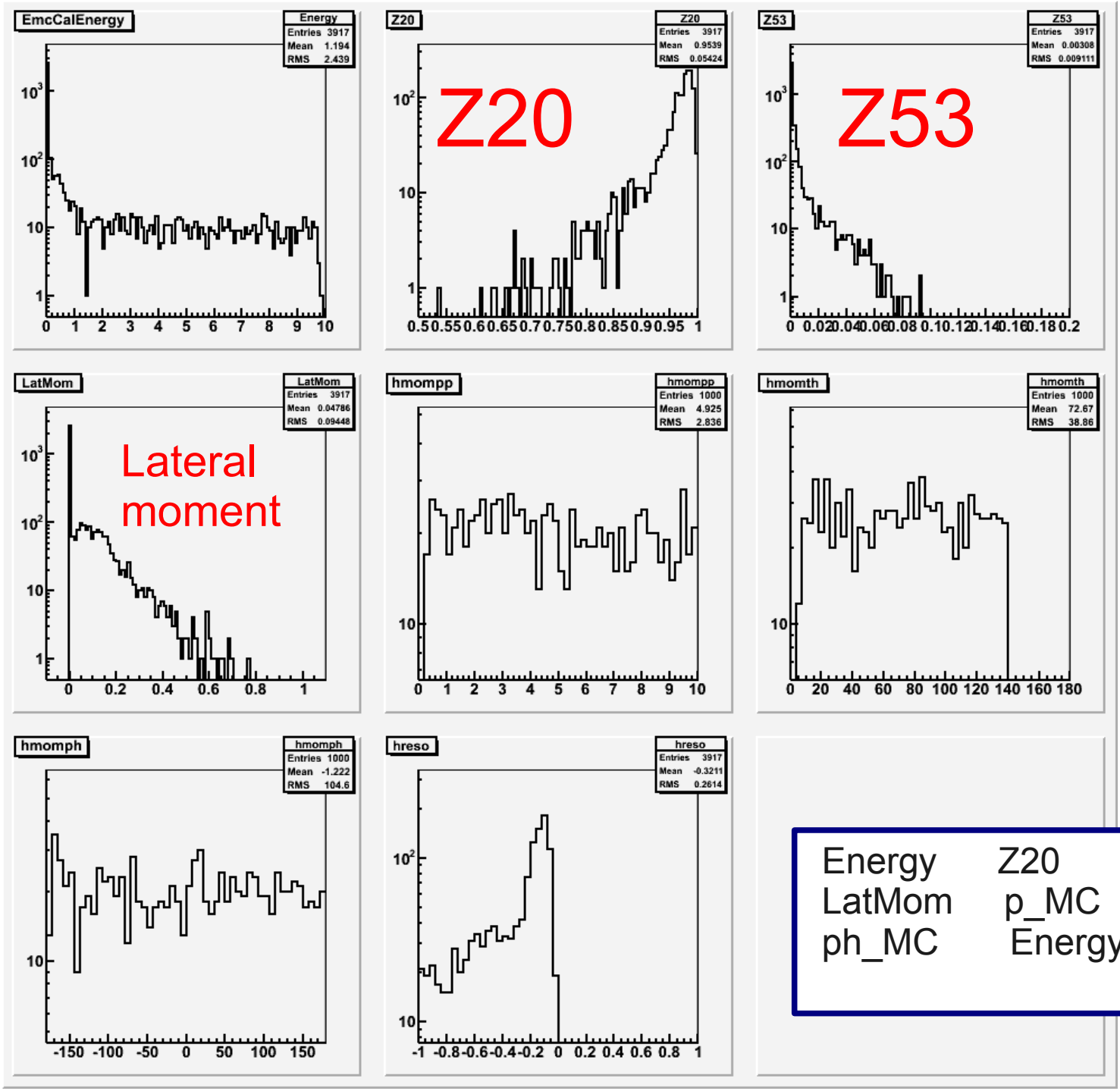




Energy	Z20	Z53
LatMom	p_MC	th_MC
ph_MC	Energy-p_MC	

Moments

π^0



Z20

Z53

Lateral moment

Energy	Z20	Z53
LatMom	p_MC	th_MC
ph_MC	Energy-p_MC	

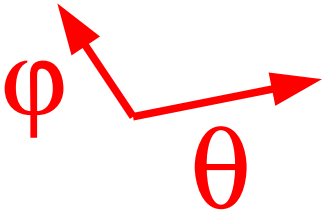
Exploration : $\bar{p}p \rightarrow e^+e^- \pi^\circ$

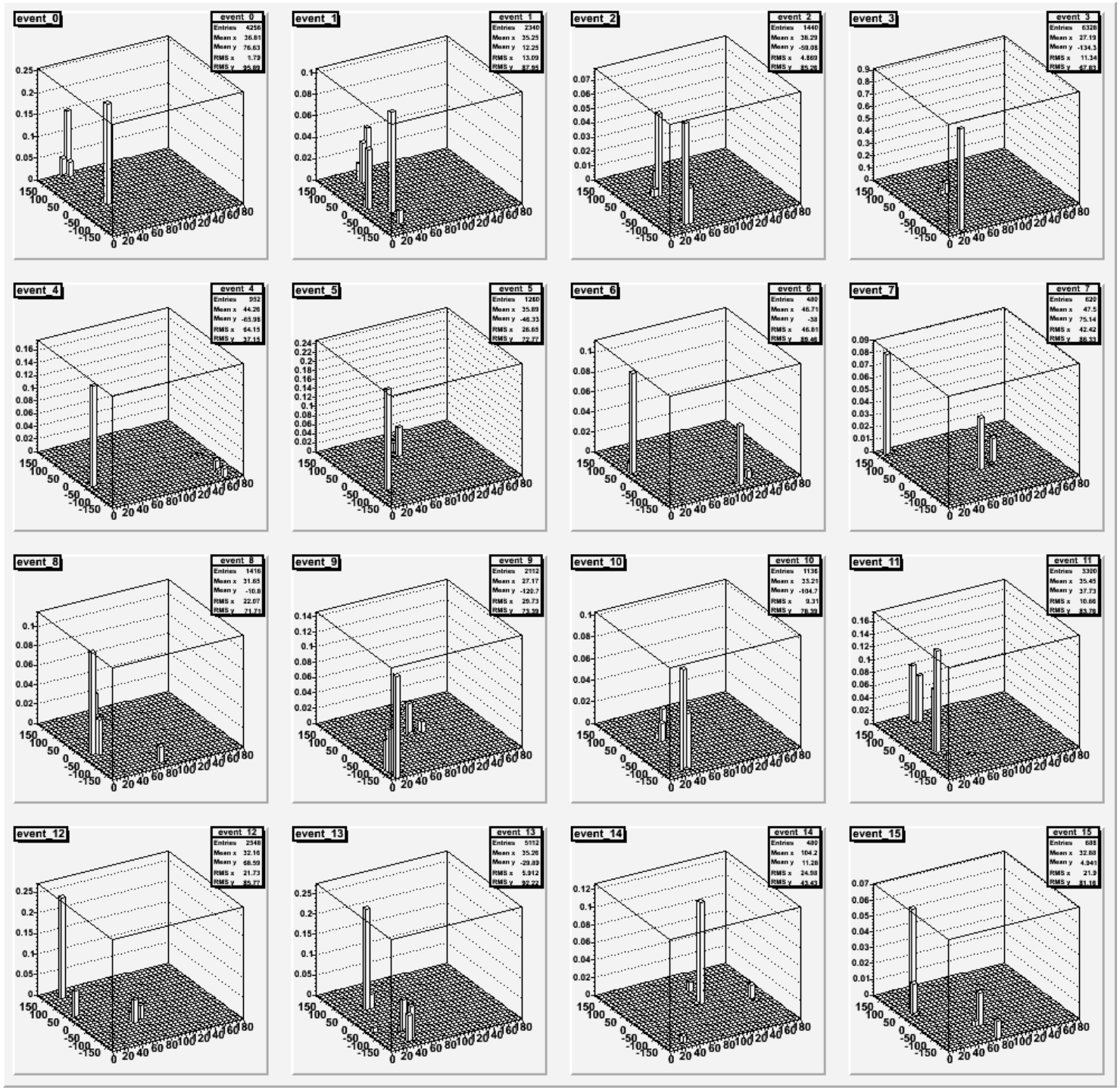
- 10000 events at 4GeV/c
- Usual chain :

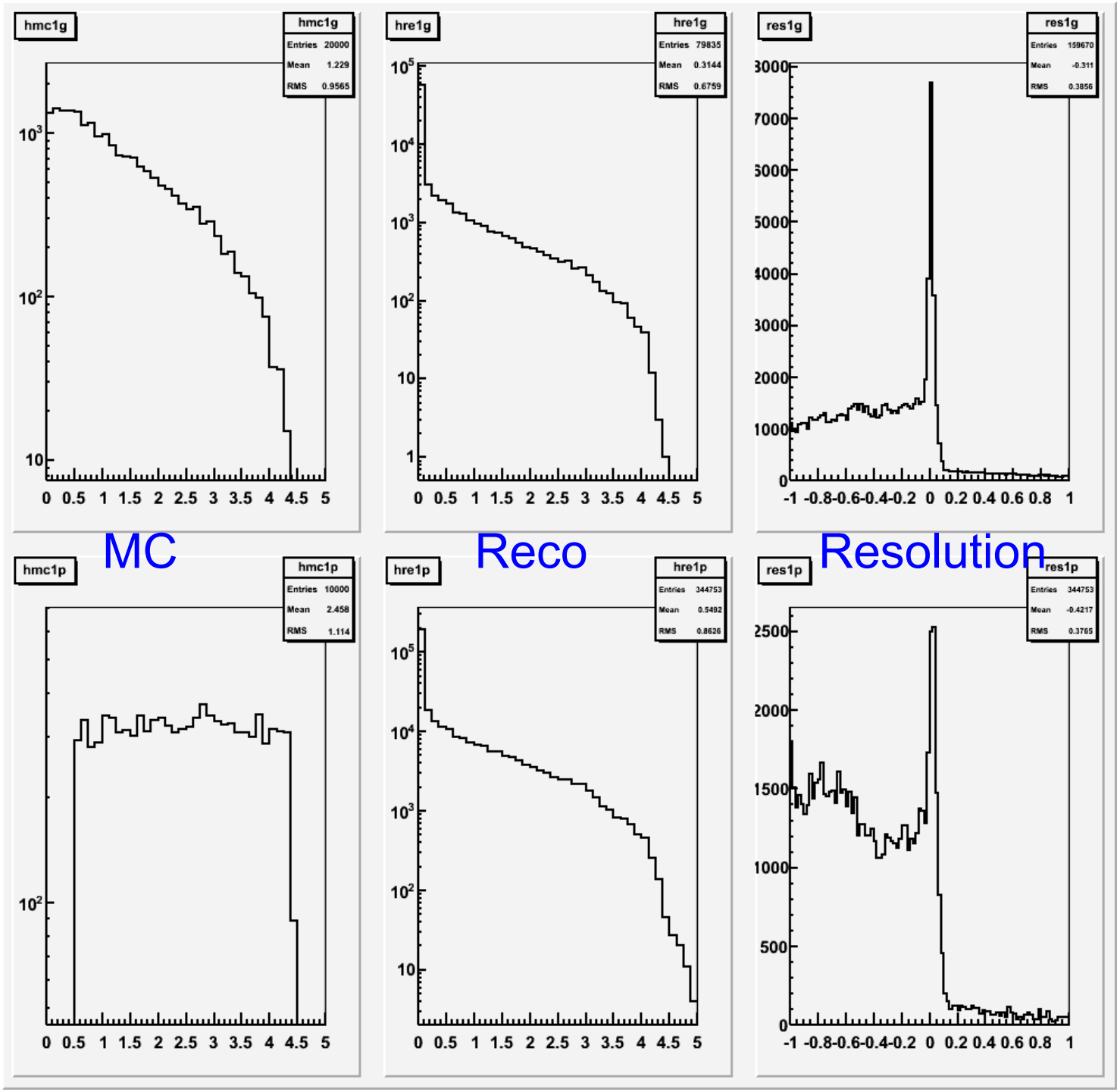
<==

- run_eepi.C
- run_sim_tpccombi_evtgen.C
- run_digi_tpccombi.C
- run_reco_tpccombi.C <= Kalman μ hypothesis...
- run_pid_tpc.C
- run_algo_tpc.C

Some events


φ
θ


event_0
event_1
event_2
event_3
event_4
event_5
event_6
event_7
event_8
event_9
event_10
event_11
event_12
event_13
event_14
event_15

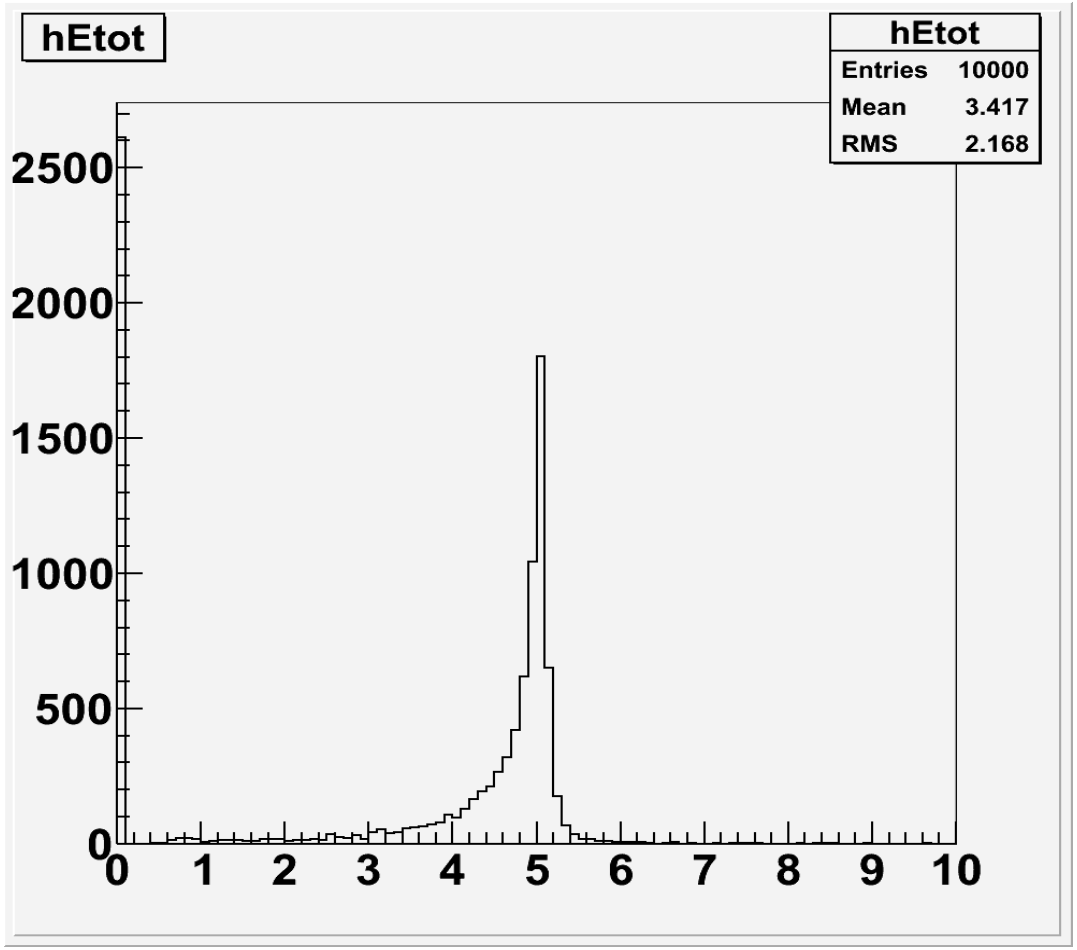


Gammas

Pi zero's

Quick selection

- Quadruple loop over 2cc and 2nc
- Minimum cuts on E
- Keep best Etot among typically five, six
- Not very serious...



Next: analysis $\bar{p}p \rightarrow e^+e^- \pi^\circ$

- Charged tracks
- Charged candidates with probability > ??
- EMC cluster associated
- Missing four momentum p_miss
- Gammas
- No associated track
- One cluster or two bumps consistent with a π°
- Kinematic fit
- Momentum vectors
- Cluster energies
- Cut on overall chi-squared