$\Psi(3770)$ study w. central tracking @ PANDA

cross-check

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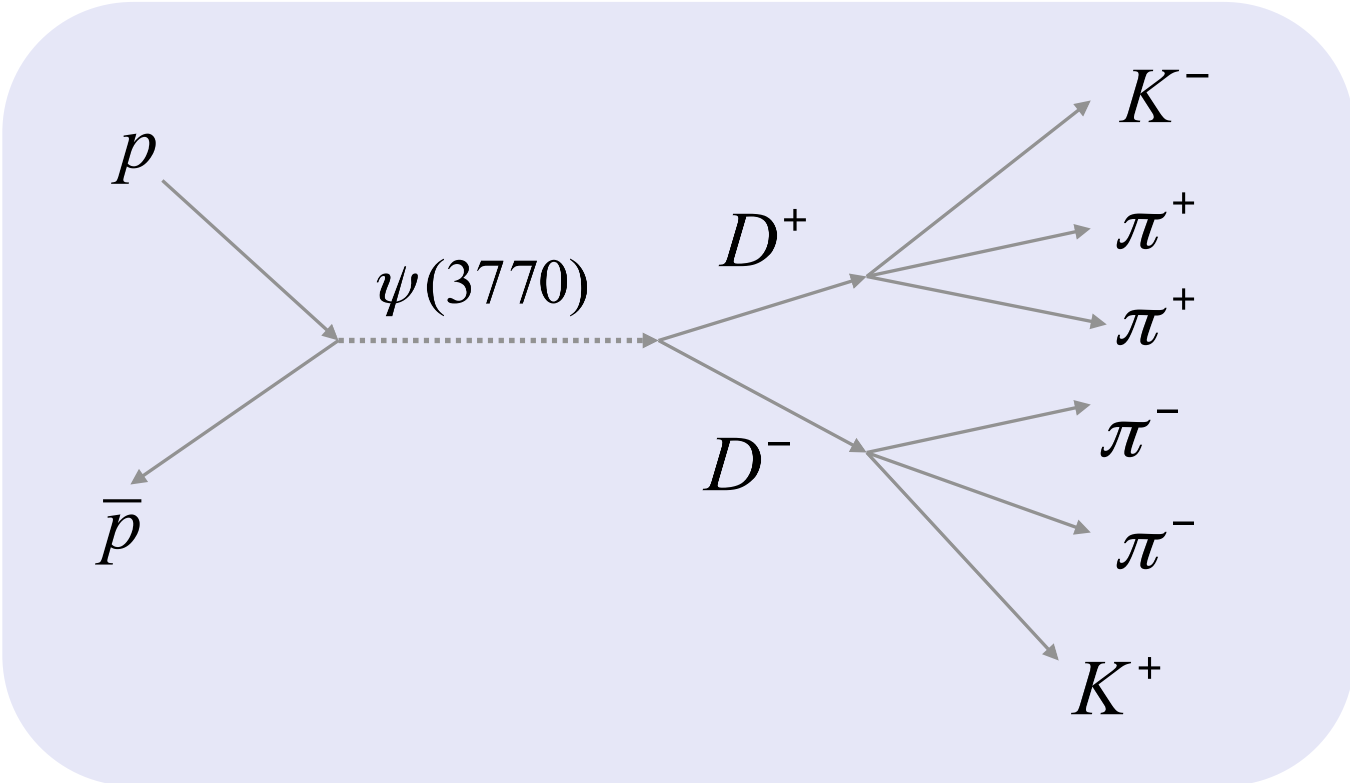
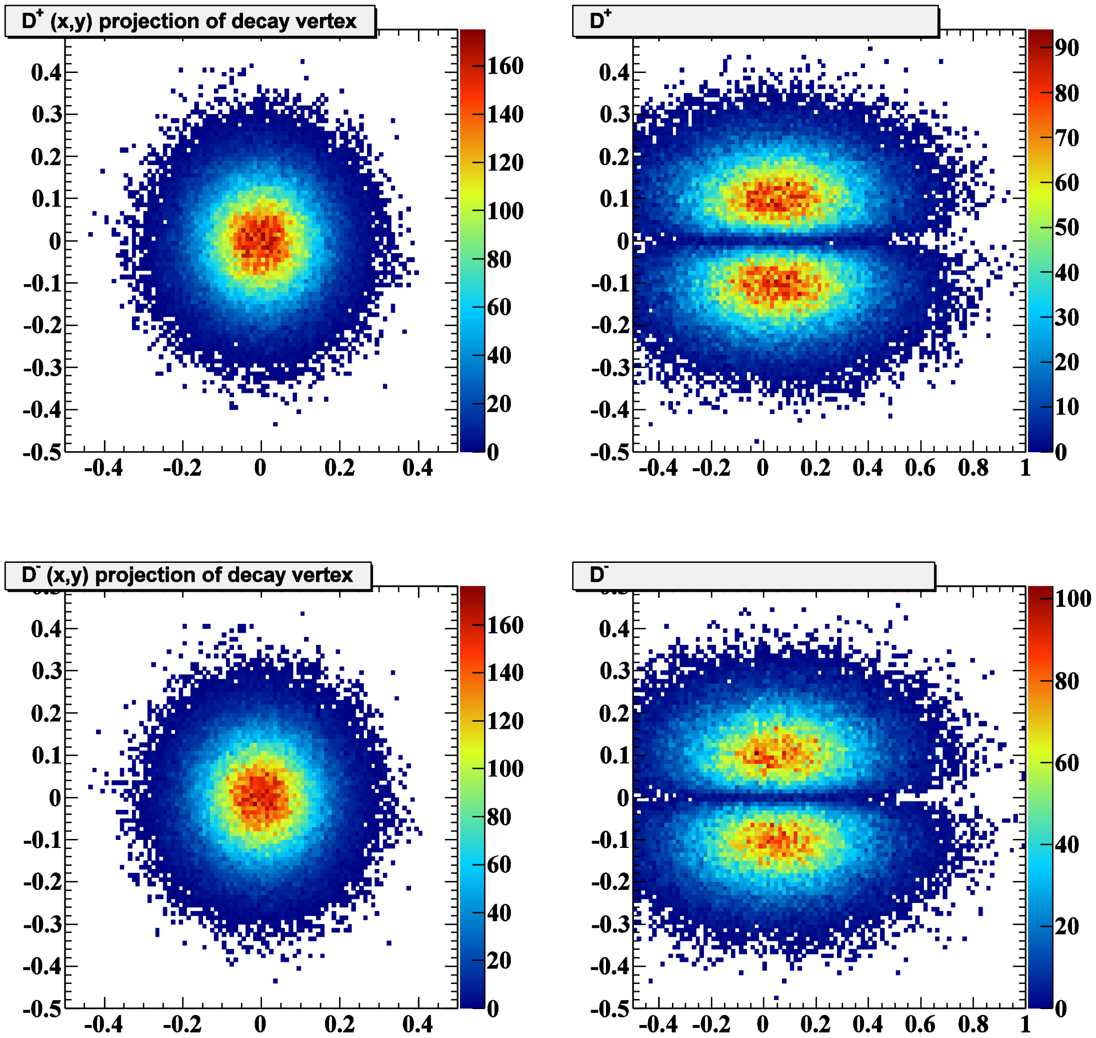
Benchmark channel : $\psi(3770) \to D^+D^- \to K^-\pi^+\pi^+K^+\pi^-\pi^-$

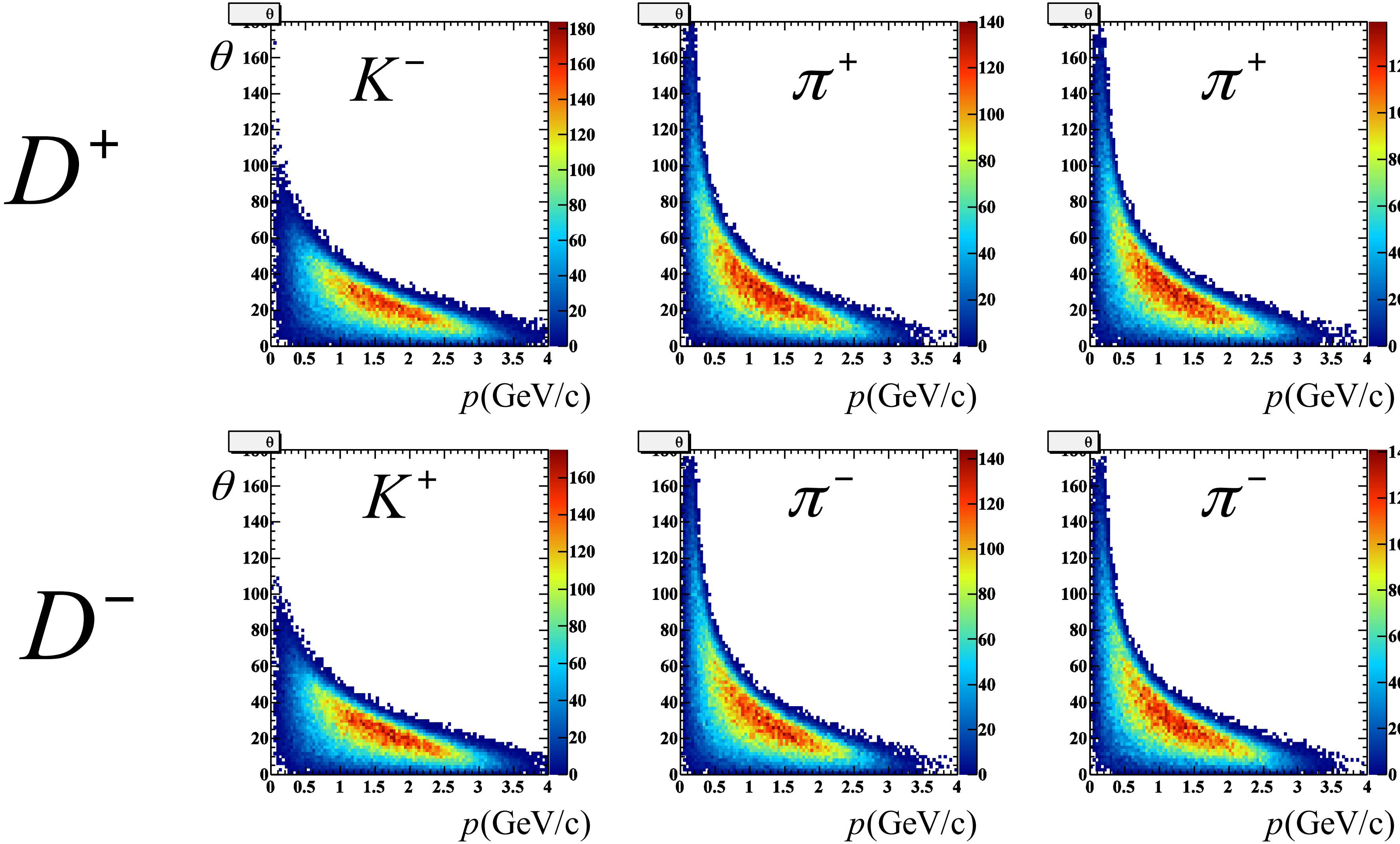


MC simulation on the PandaGrid
- TPC mode : run984
- STT mode : run934oldnocu

- Generated psi(3770) event
- Vertex distribution of D+ and D-



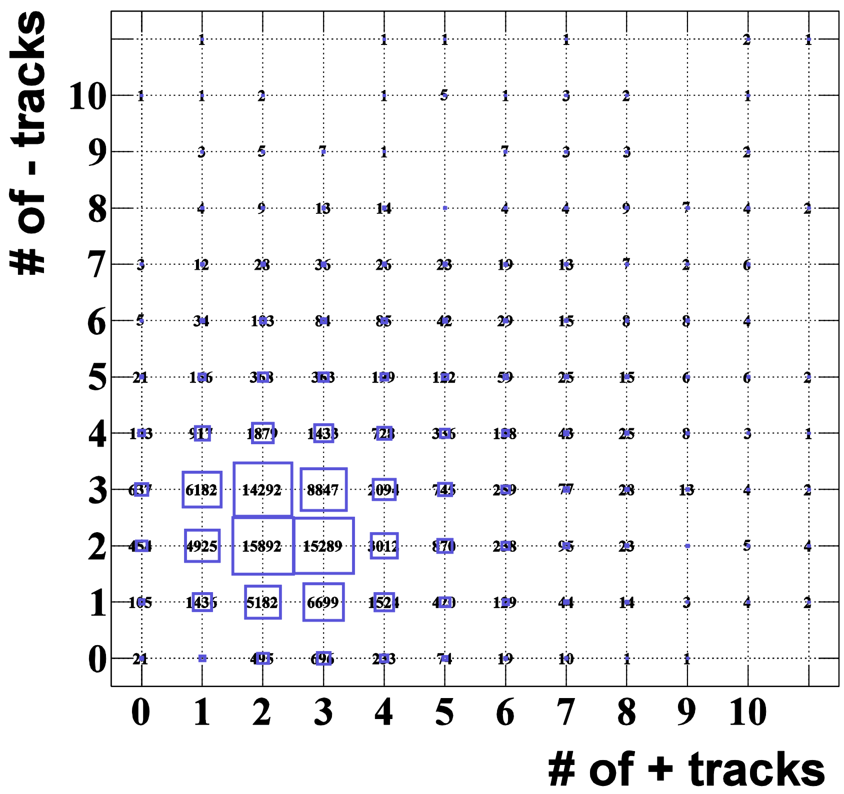
- Generated psi(3770) event : Momentum and Theta distribution for D+ and D-



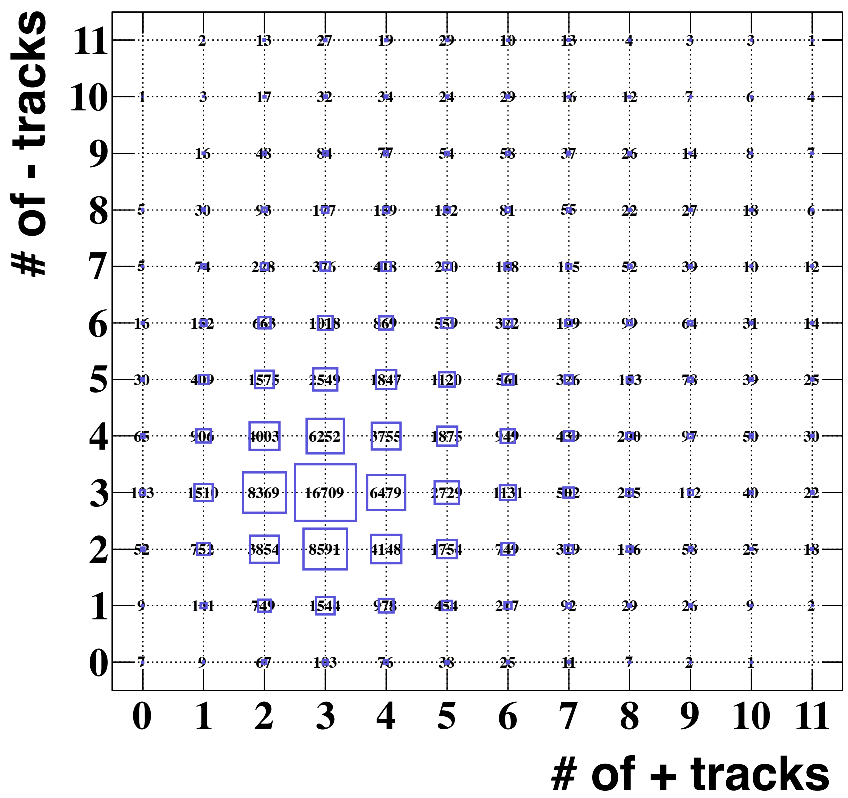
Event selection I

Reconstruction of charged tracks by TPC and STT :
required at least 3 positive and 3 negative tracks.

TPC(run984) : 99000 evt.

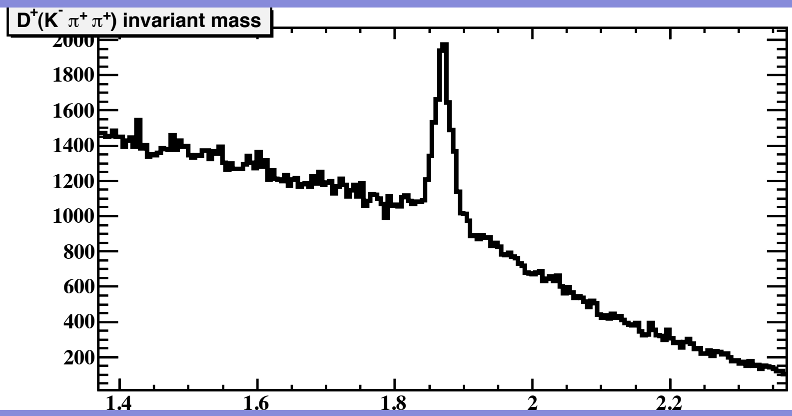


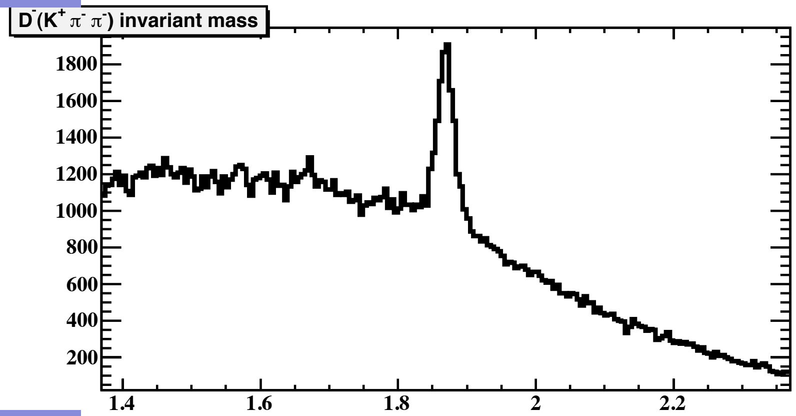
STT(run934oldnocu) : 98000 evt.



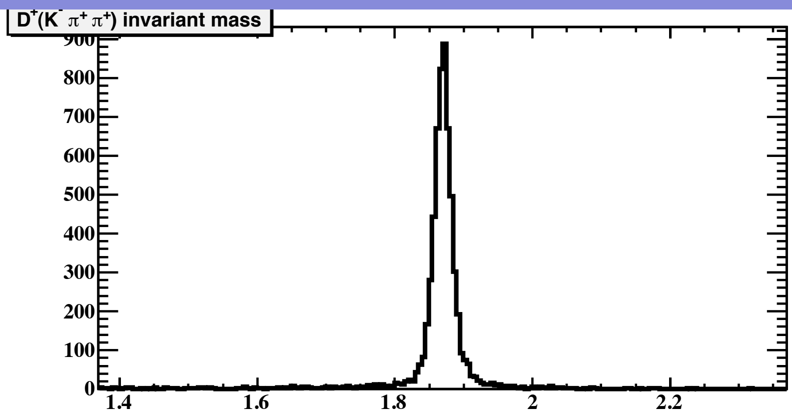
Event selection II

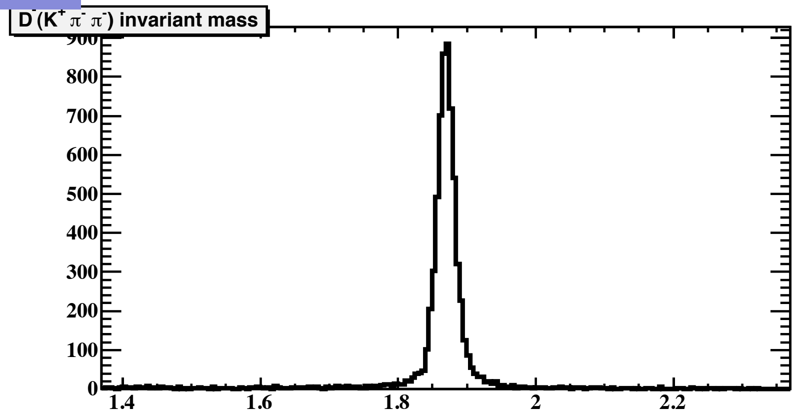
TPC mode : D+ and D- reconstruction





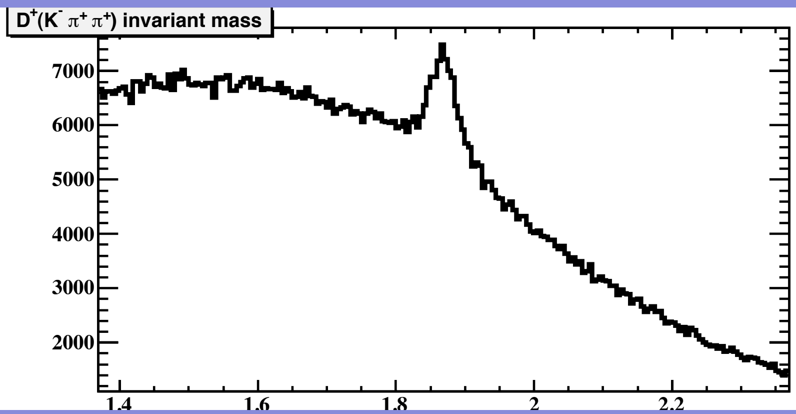
TPC mode : MC true matched D+ and D-

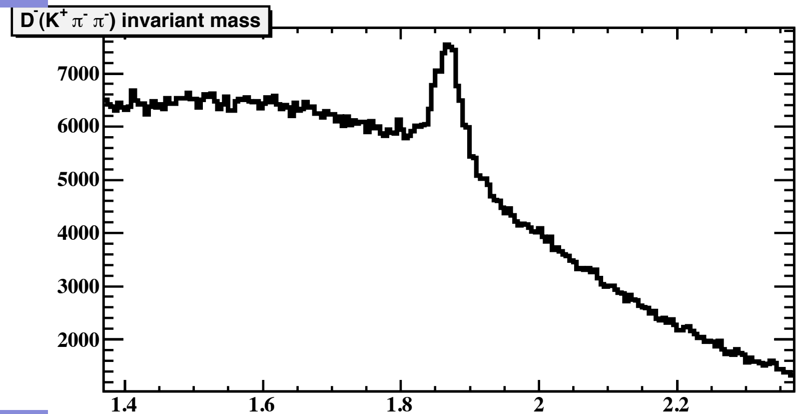




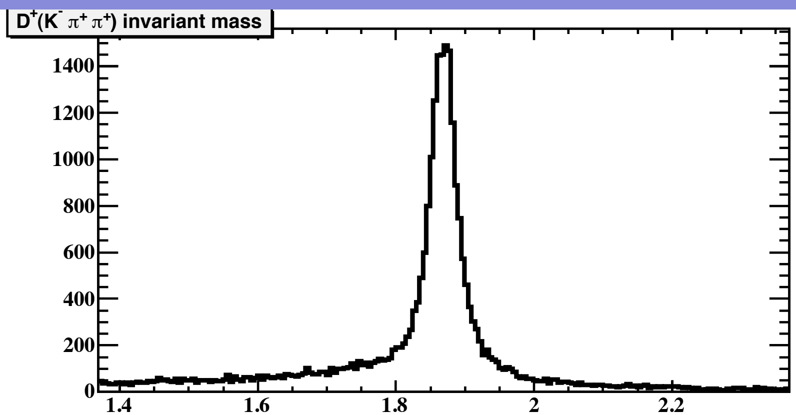
Event selection II

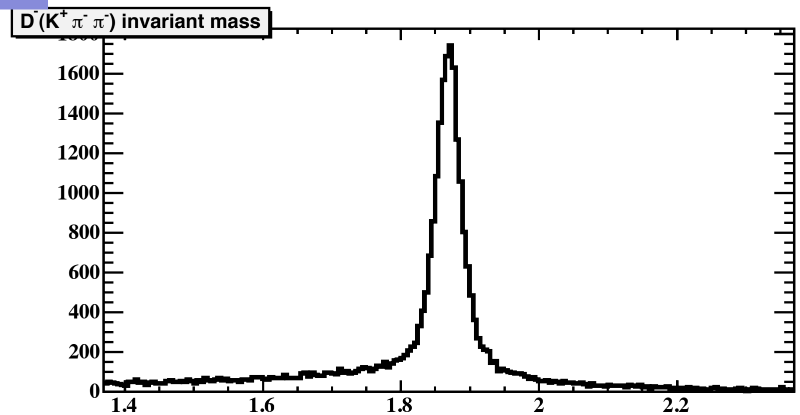
STT mode : D+ and D- reconstruction





STT mode : MC true matched D+ and D-

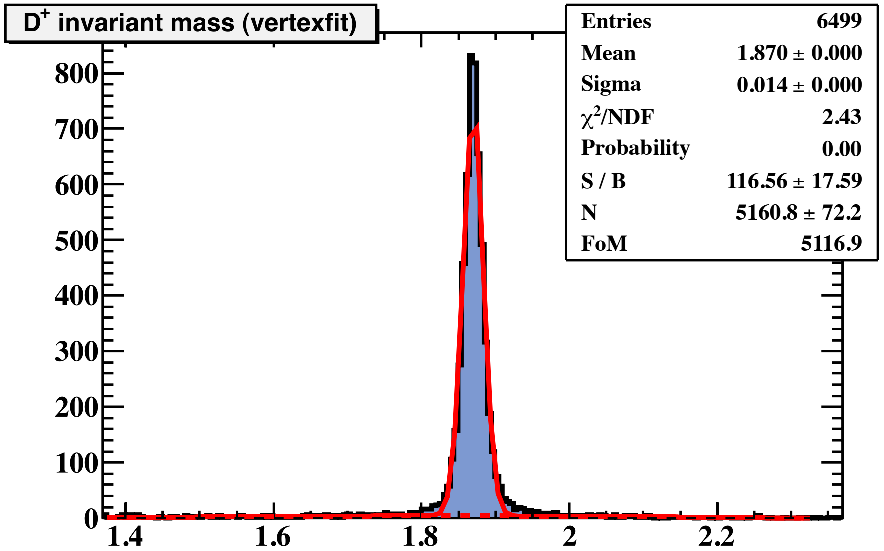


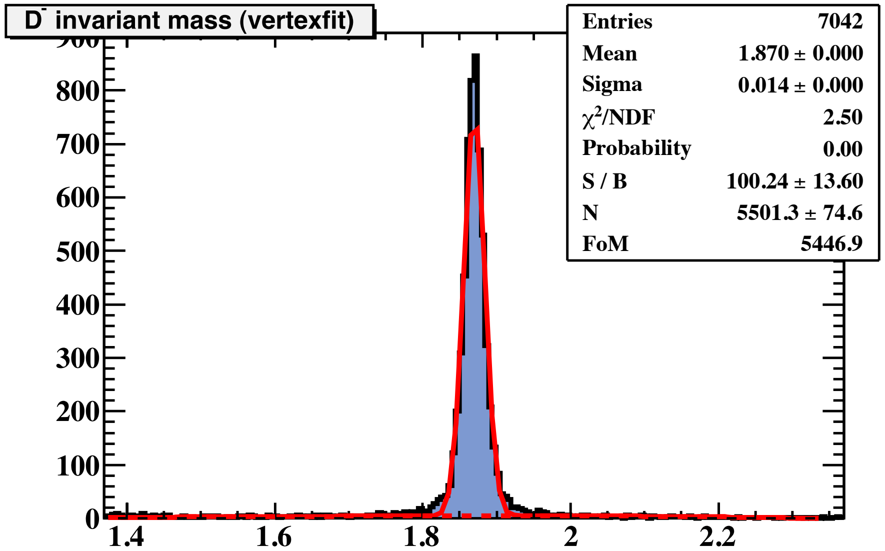


Event selection III

- MC true matching (ideal PID)
- 1 candidate in 1 event is identified from PndKinVertex fit with best probability

TPC mode : Fitted D+ and D-

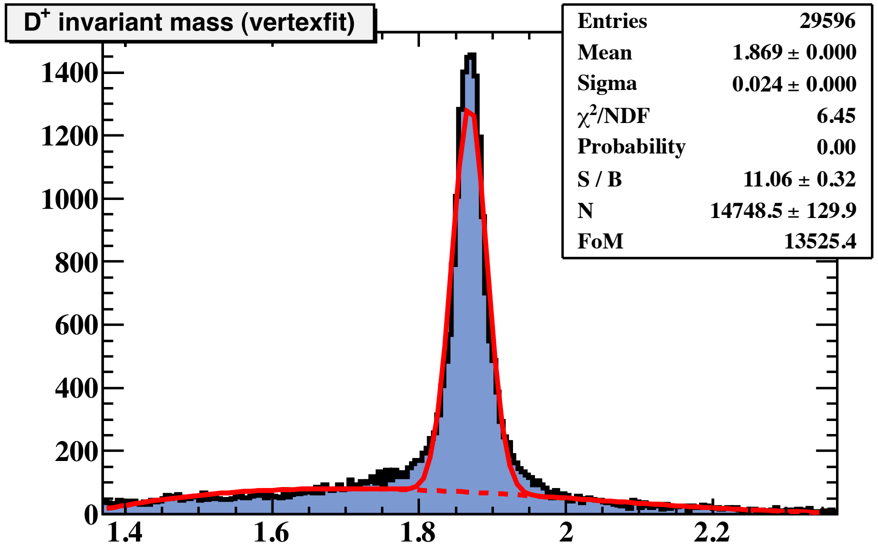


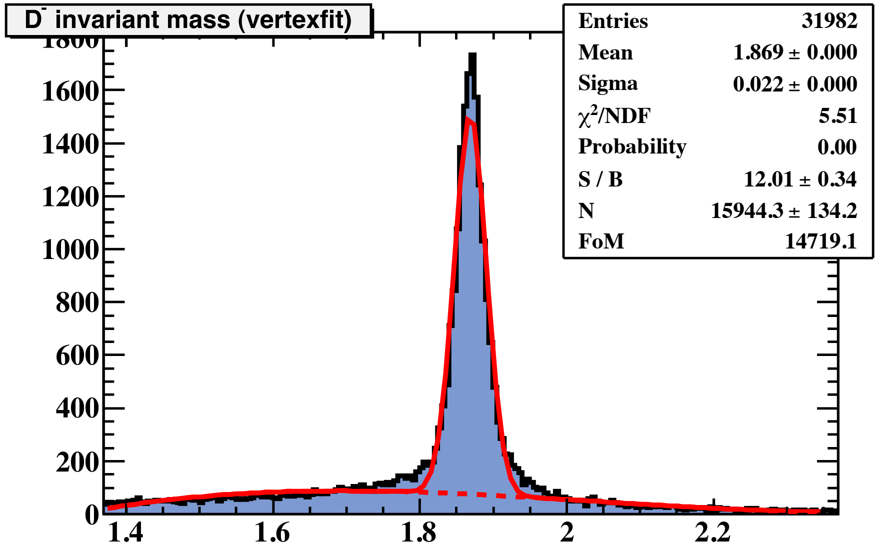


Event selection III

- MC true matching (ideal PID)
- 1 candidate in 1 event is identified from PndKinVertex fit with best probability

STT mode : Fitted D+ and D-

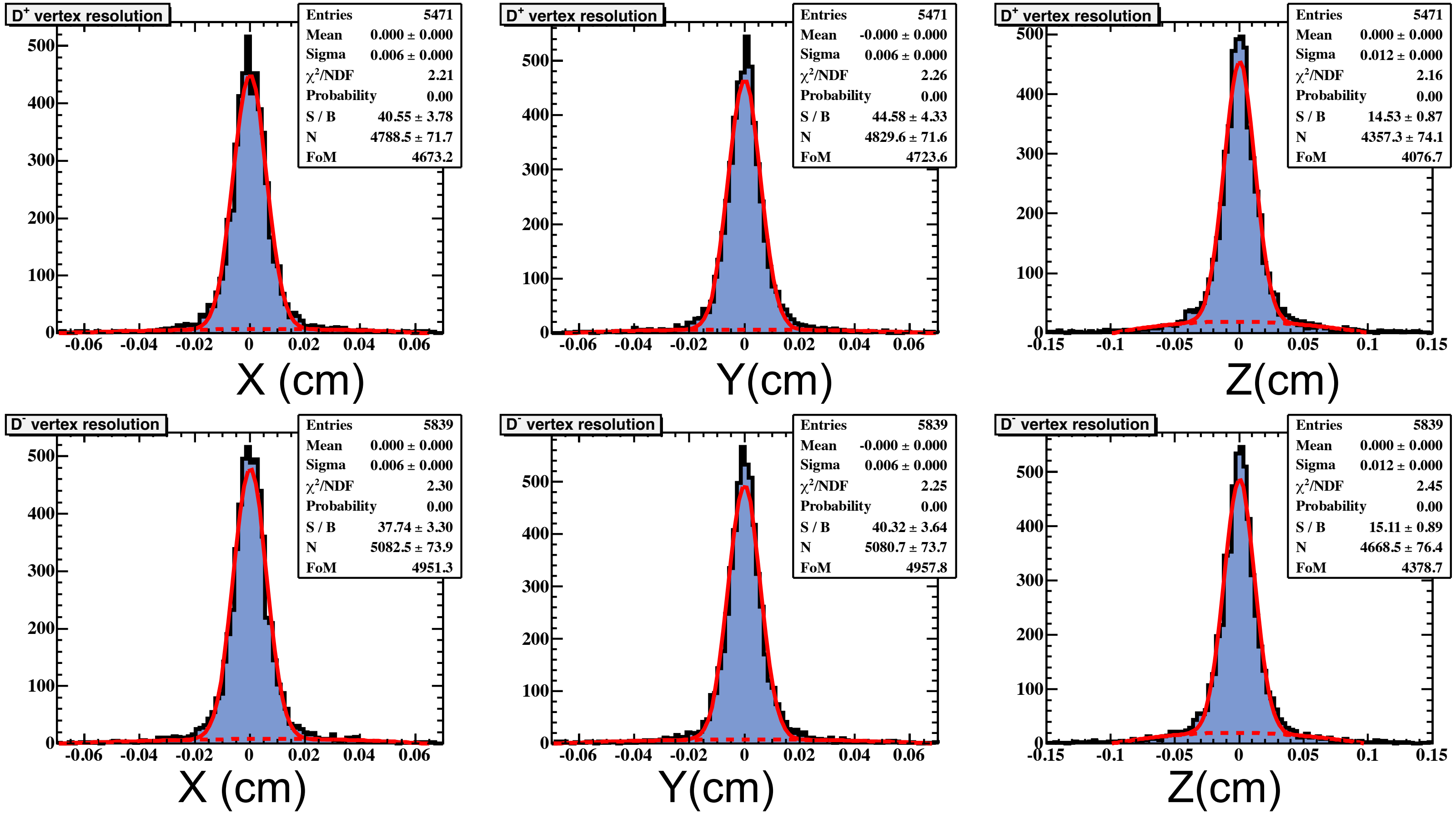




Event selection III

- Vertex position within mass window $1.8093 < m_D < 1.9293$ GeV

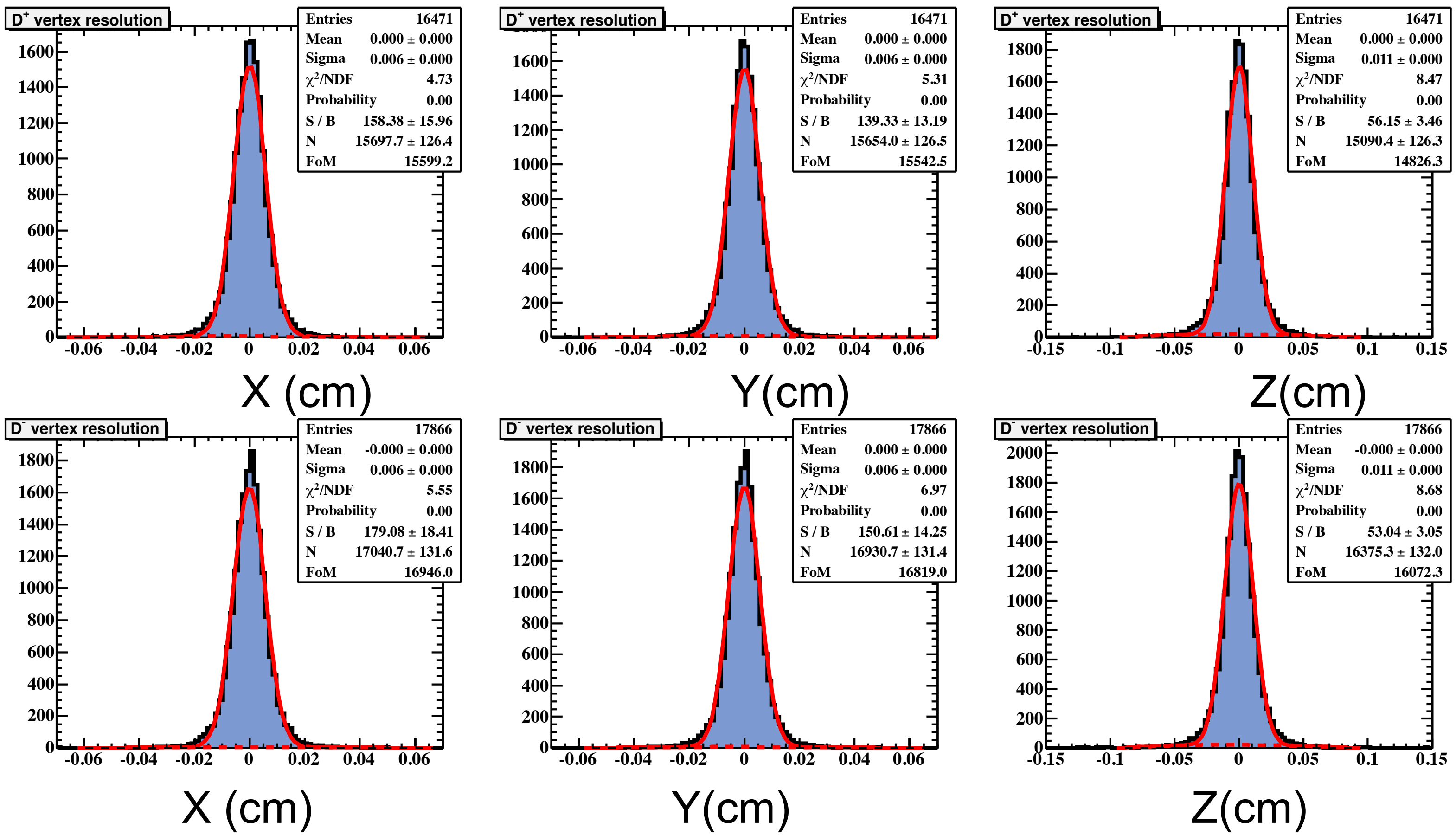
TPC mode : Vertex resolution



Event selection III

- Vertex position within mass window 1.8093 < m_D < 1.9293 GeV

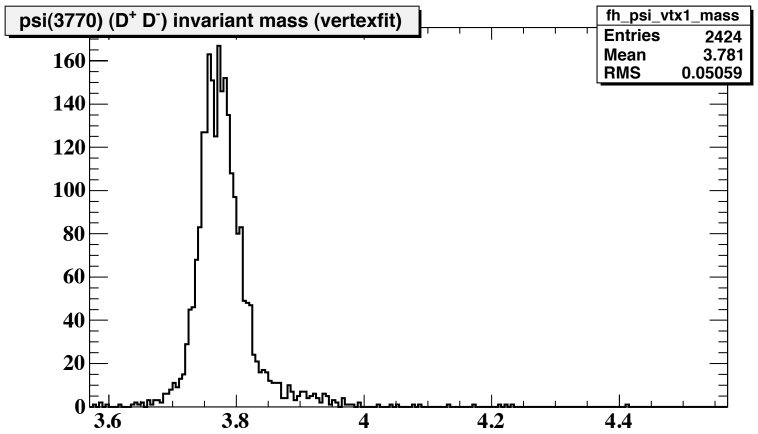
STT mode : Vertex resolution



Event selection for Psi(3770)

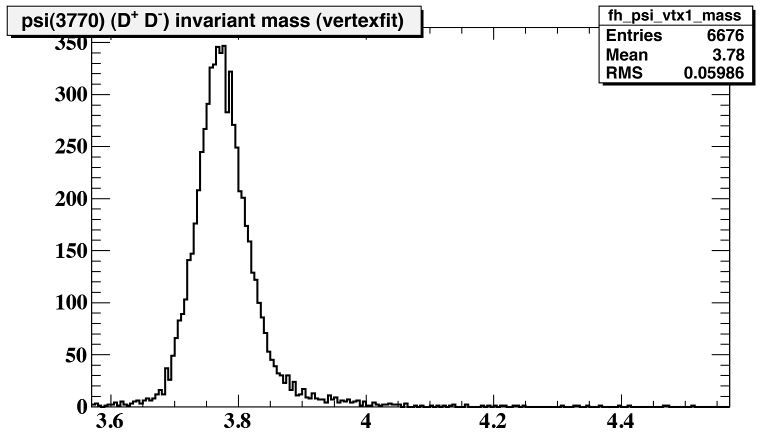
- Combined D+ and D- to psi(3770)
- Just one best candidate of psi(3770) in one event, identified by highest probabilit y(chi2) from vertex fit

TPC



Global efficiency
ε = rec. / gen. = 2424 / 99K
= 2.4 %

STT

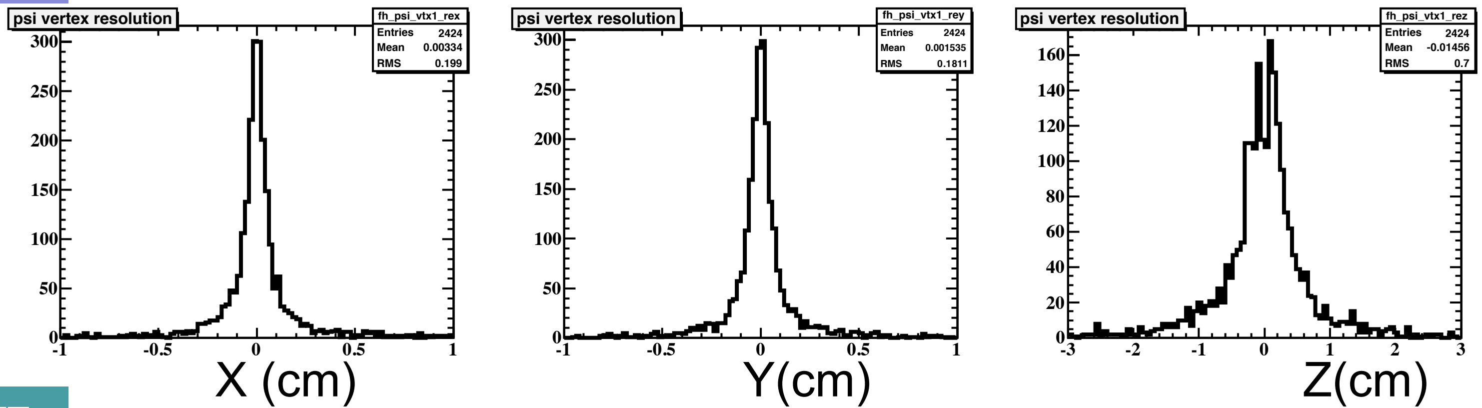


Global efficiency
ε = rec. / gen. = 6676 / 98K
= 6.8 %

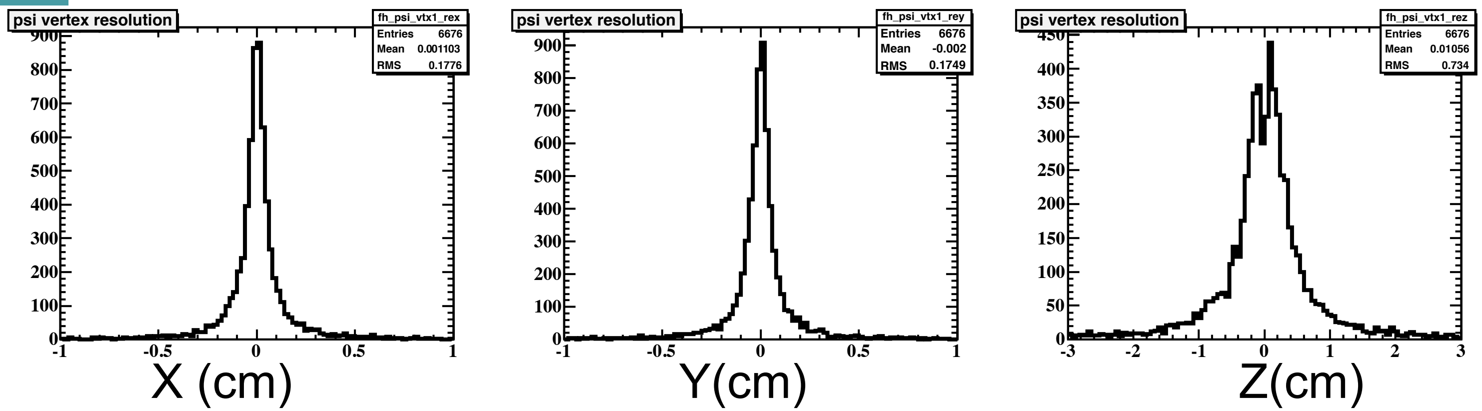
Event selection for Psi(3770)

- Combined D+ and D- to psi(3770)
- Just one best candidate of psi(3770) in one event, identified by highest probabilit y(chi2) from vertex fit

TPC



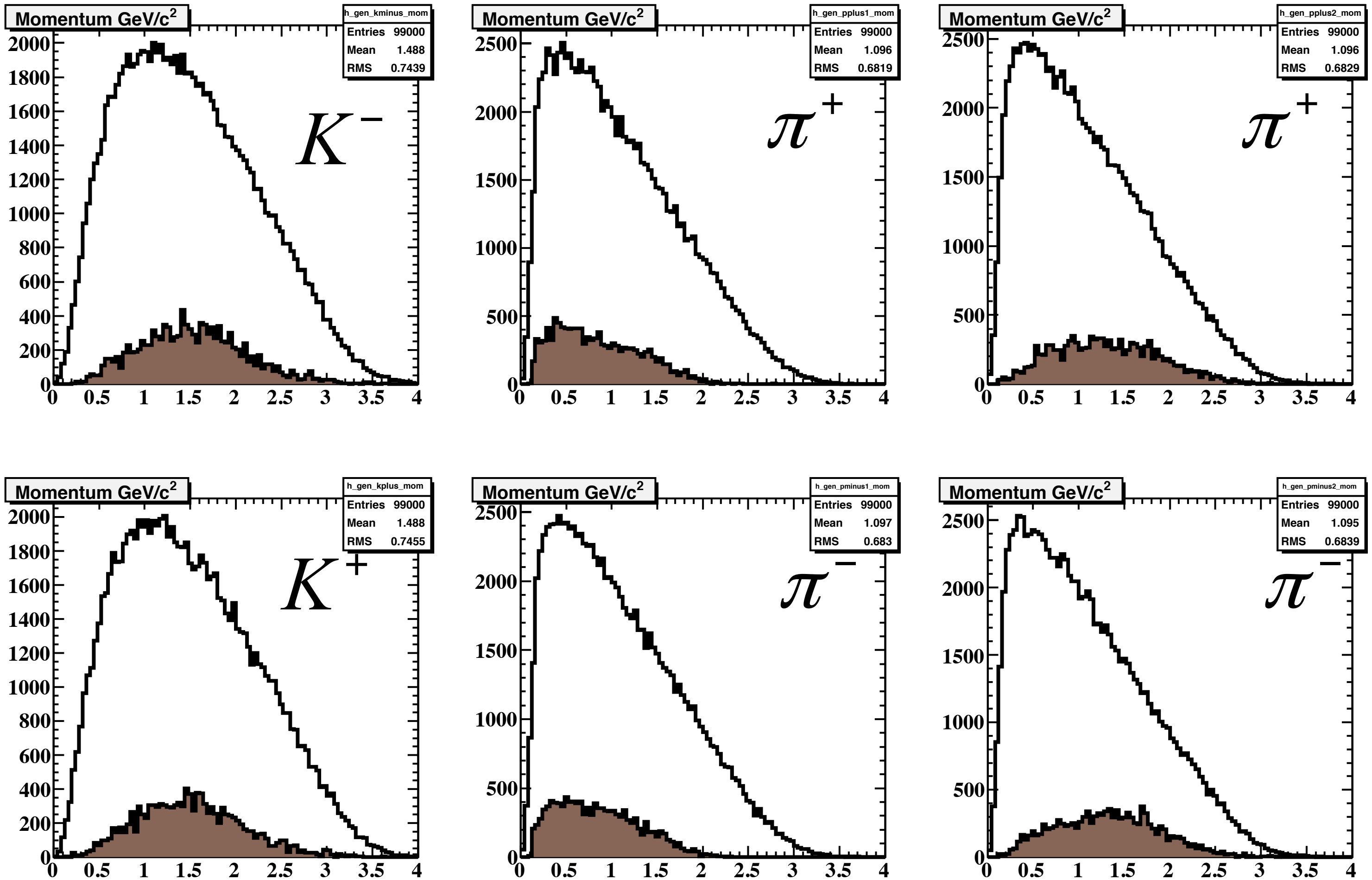
STT



Event selection for Psi(3770)

TPC mode

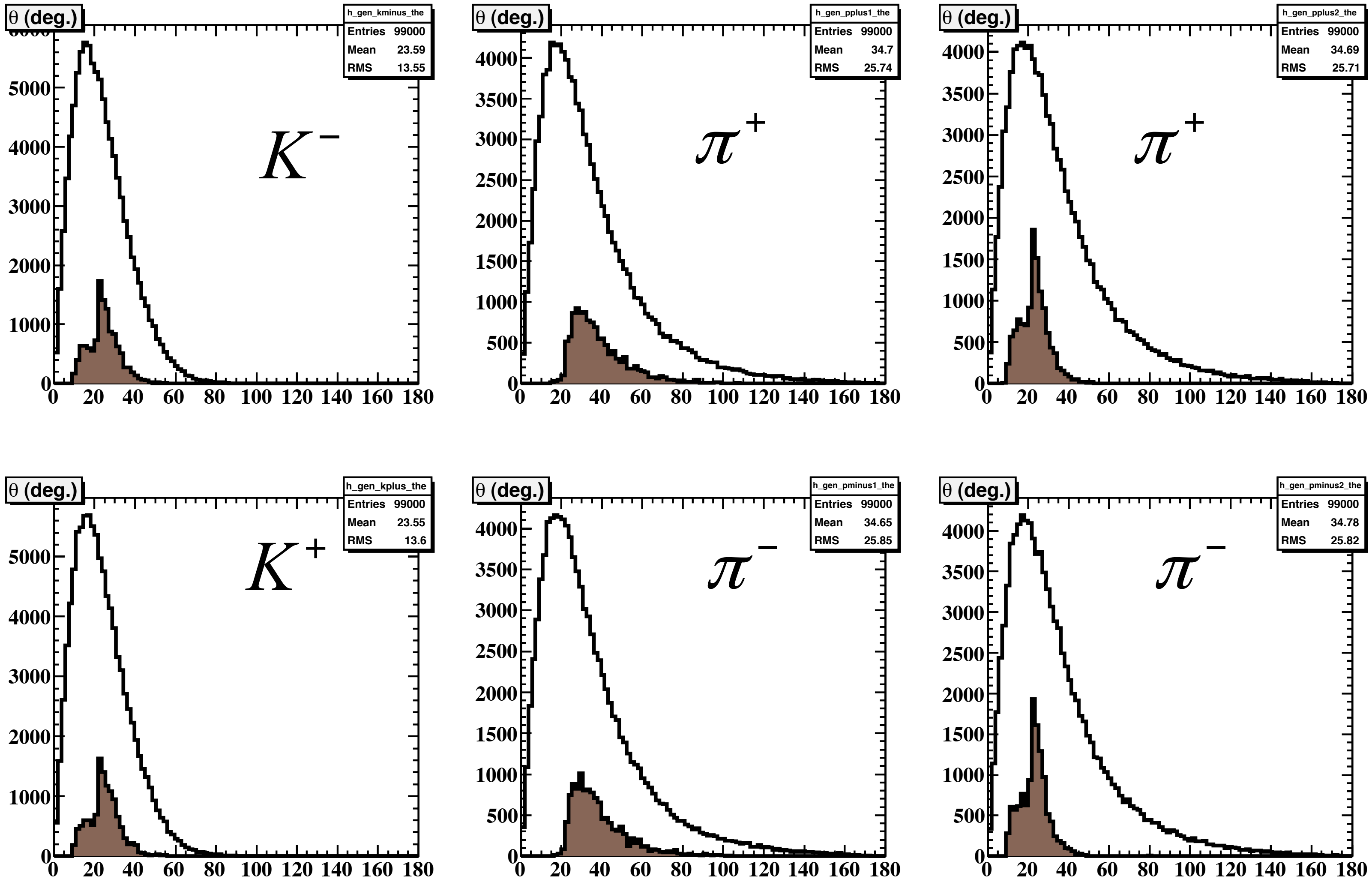
- psi(3770) momentum : generated vs reconstructed (scaled by factor 5)



Event selection for Psi(3770)

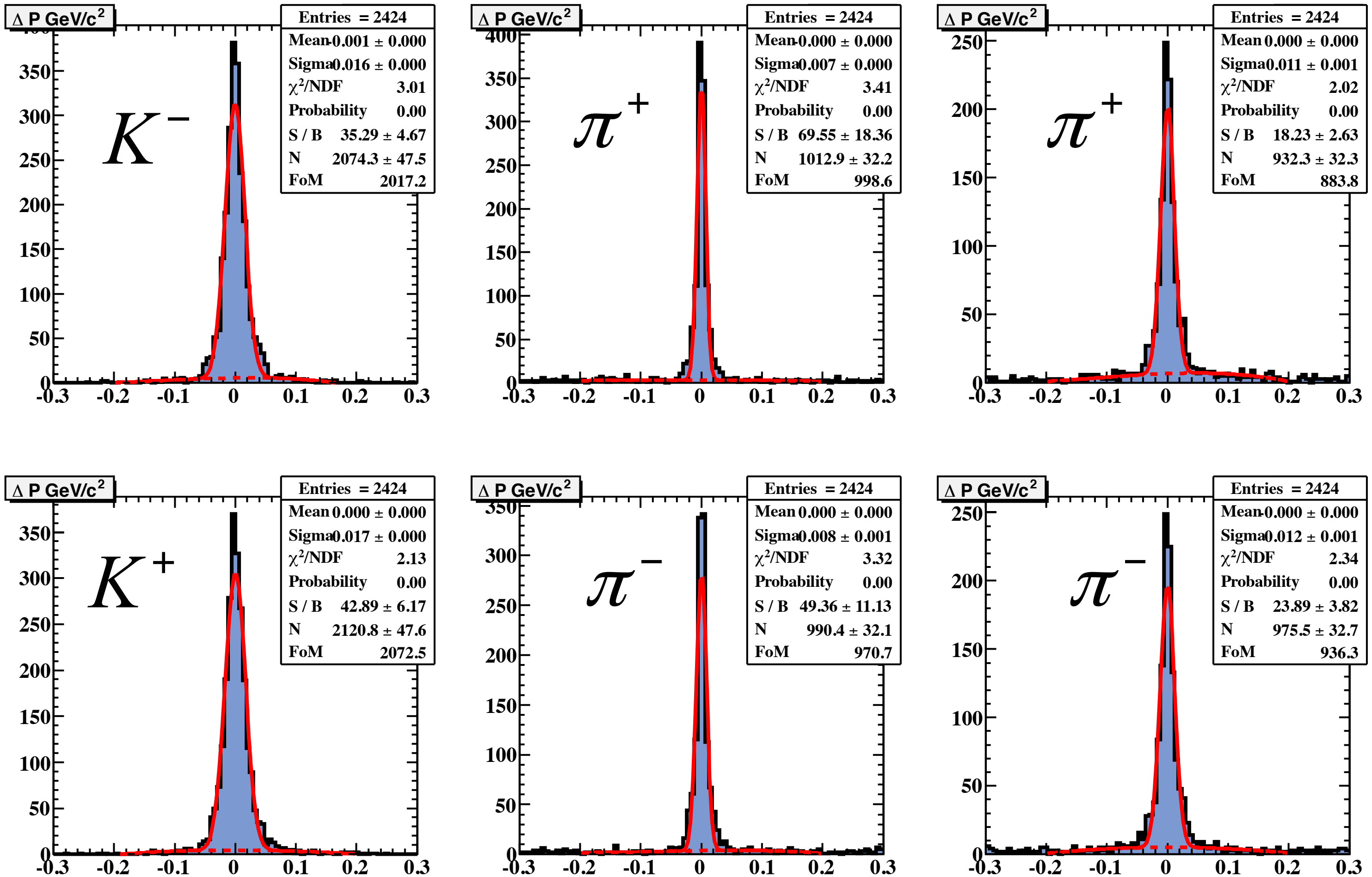
TPC mode

- psi(3770) theta : generated vs reconstructed (scaled by factor 5)



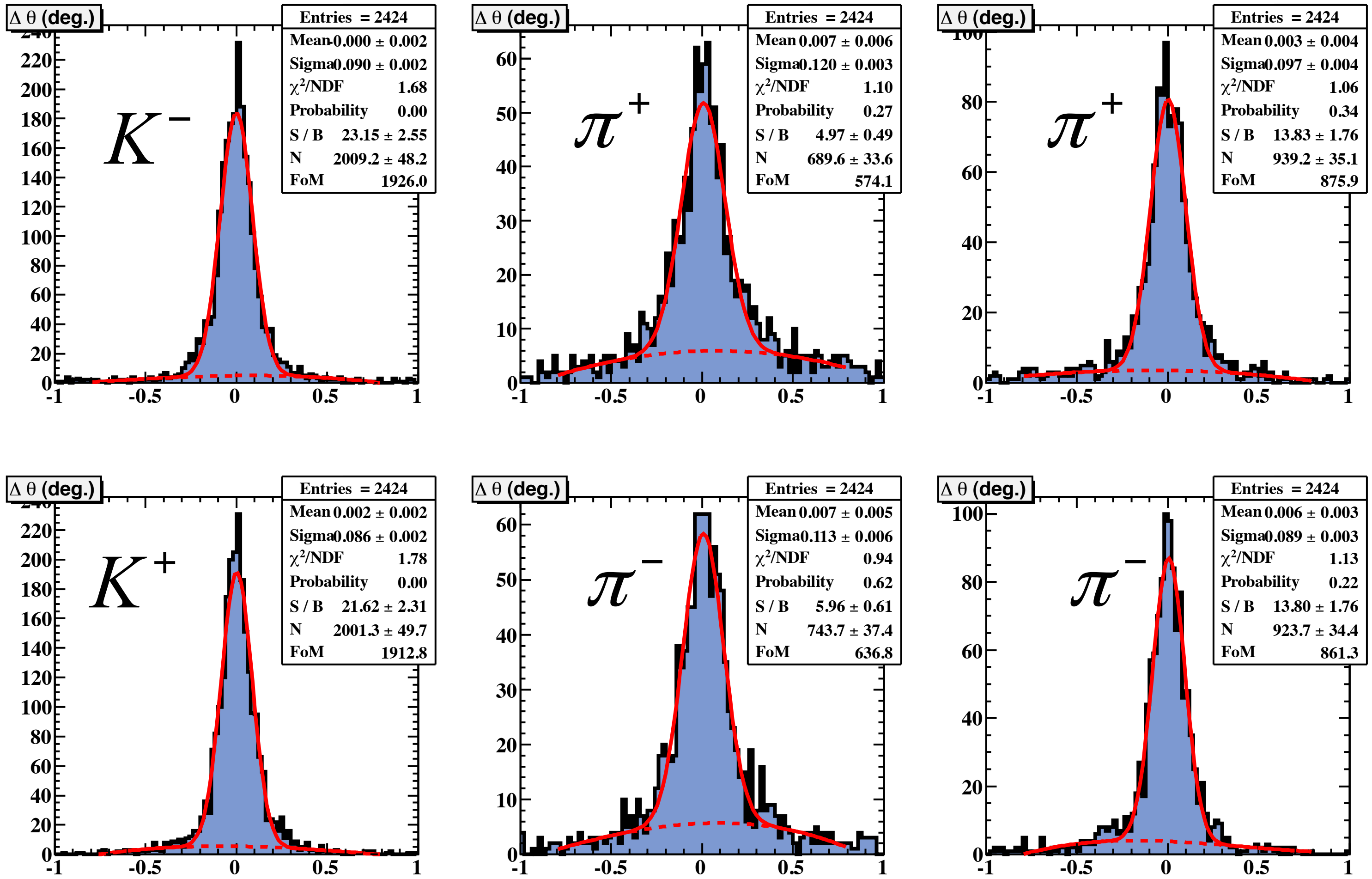
Event selection for Psi(3770)

TPC mode momentum resolution



Event selection for Psi(3770)

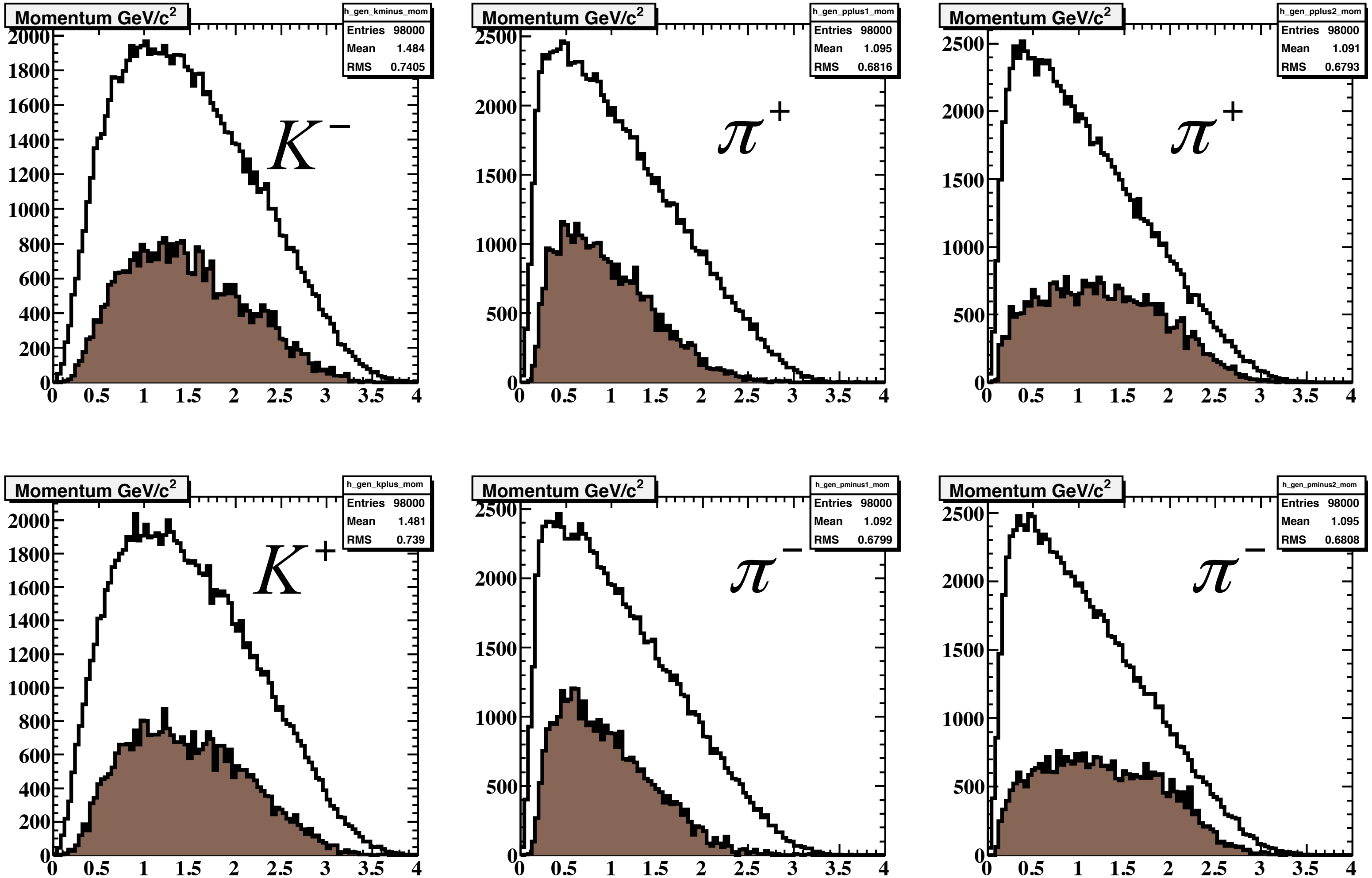
TPC mode theta resolution



Event selection for Psi(3770)

STT mode

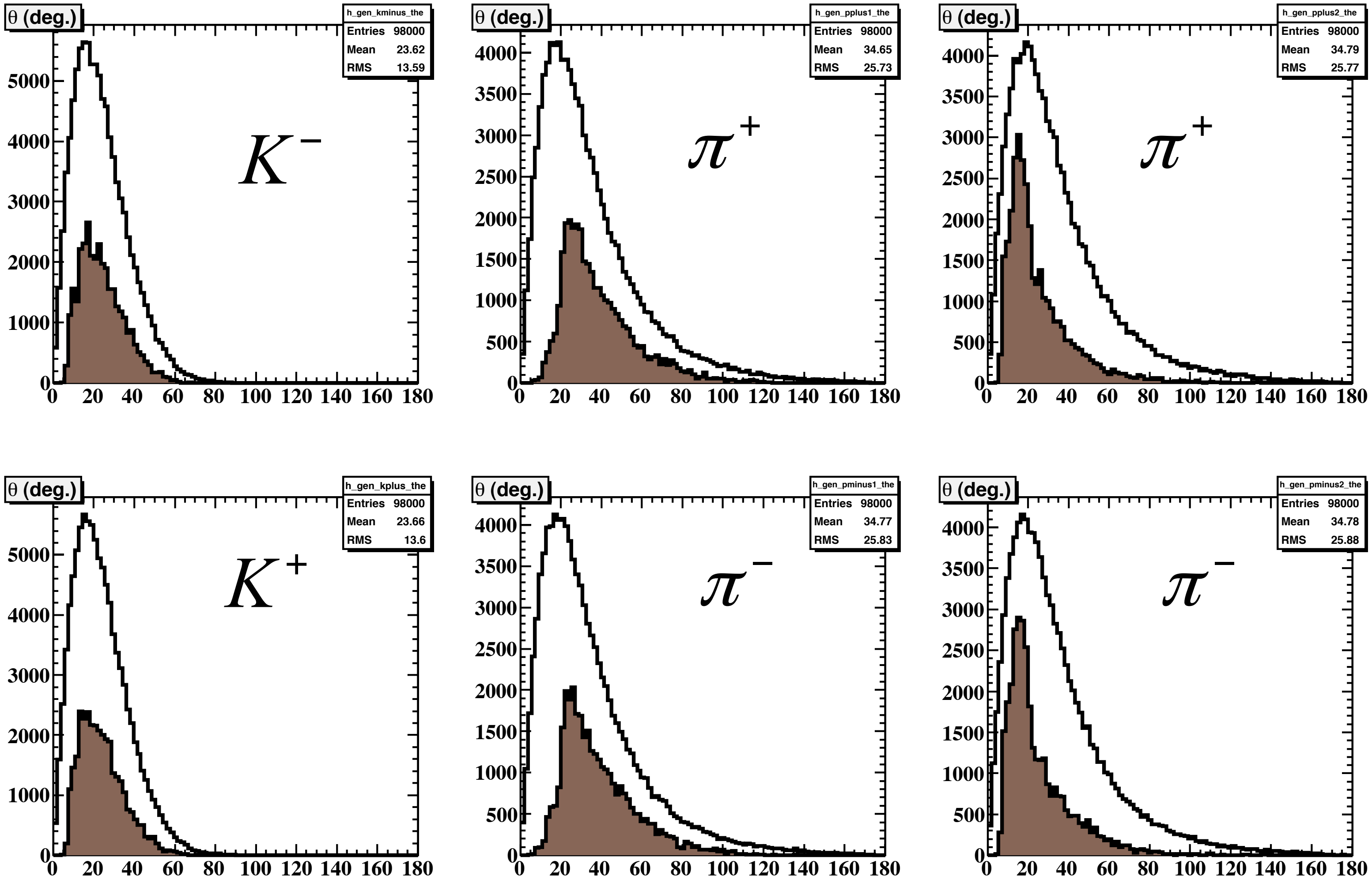
- psi(3770) momentum : generated vs reconstructed (scaled by factor 5)



Event selection for Psi(3770)

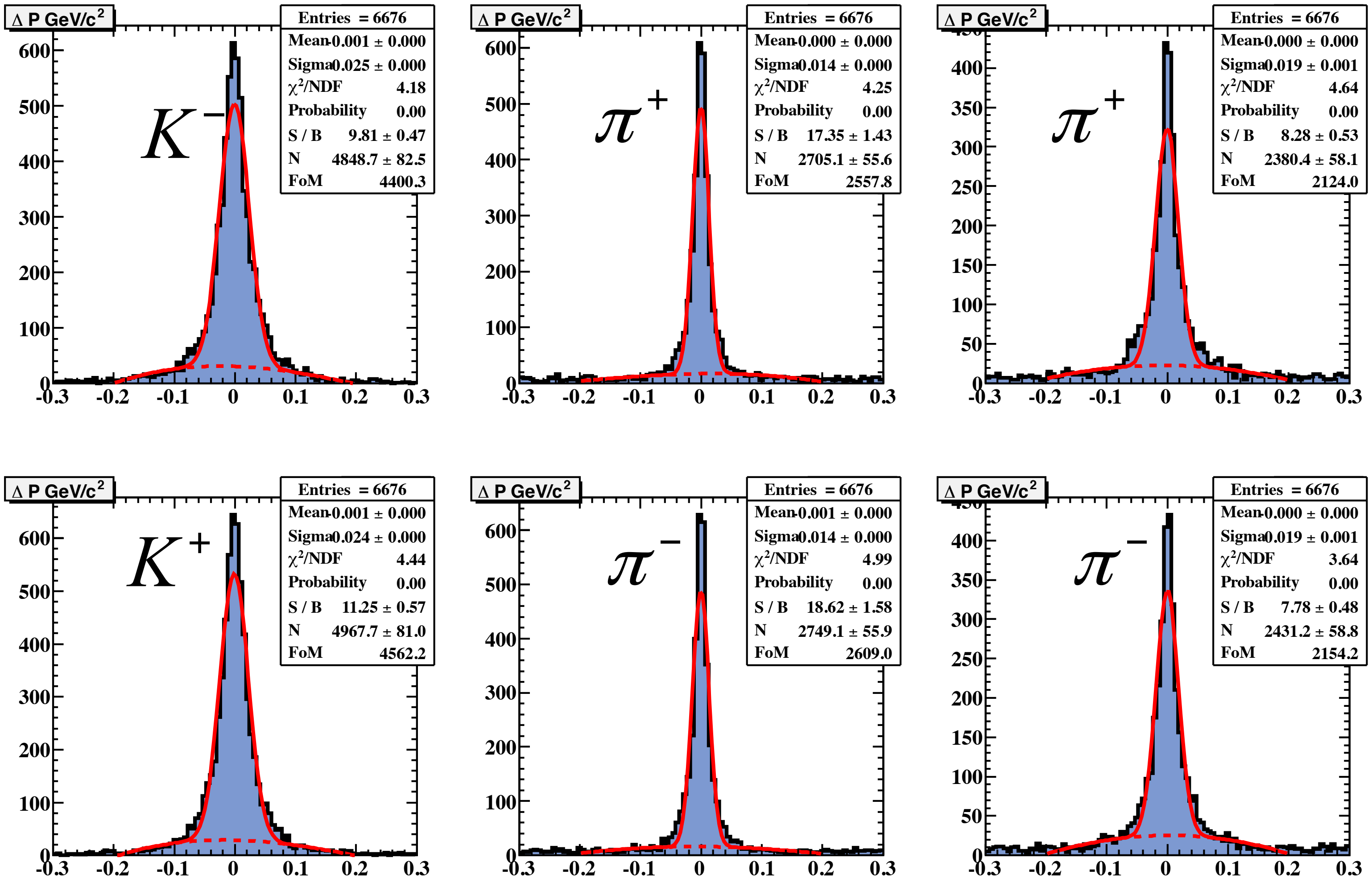
STT mode

- psi(3770) theta generated vs reconstructed (scaled by factor 5)



Event selection for Psi(3770)

STT mode mom resolution



Event selection for Psi(3770)

STT mode theta resolution