QA of B-> J/ψ + X embedding

MTD Meeting
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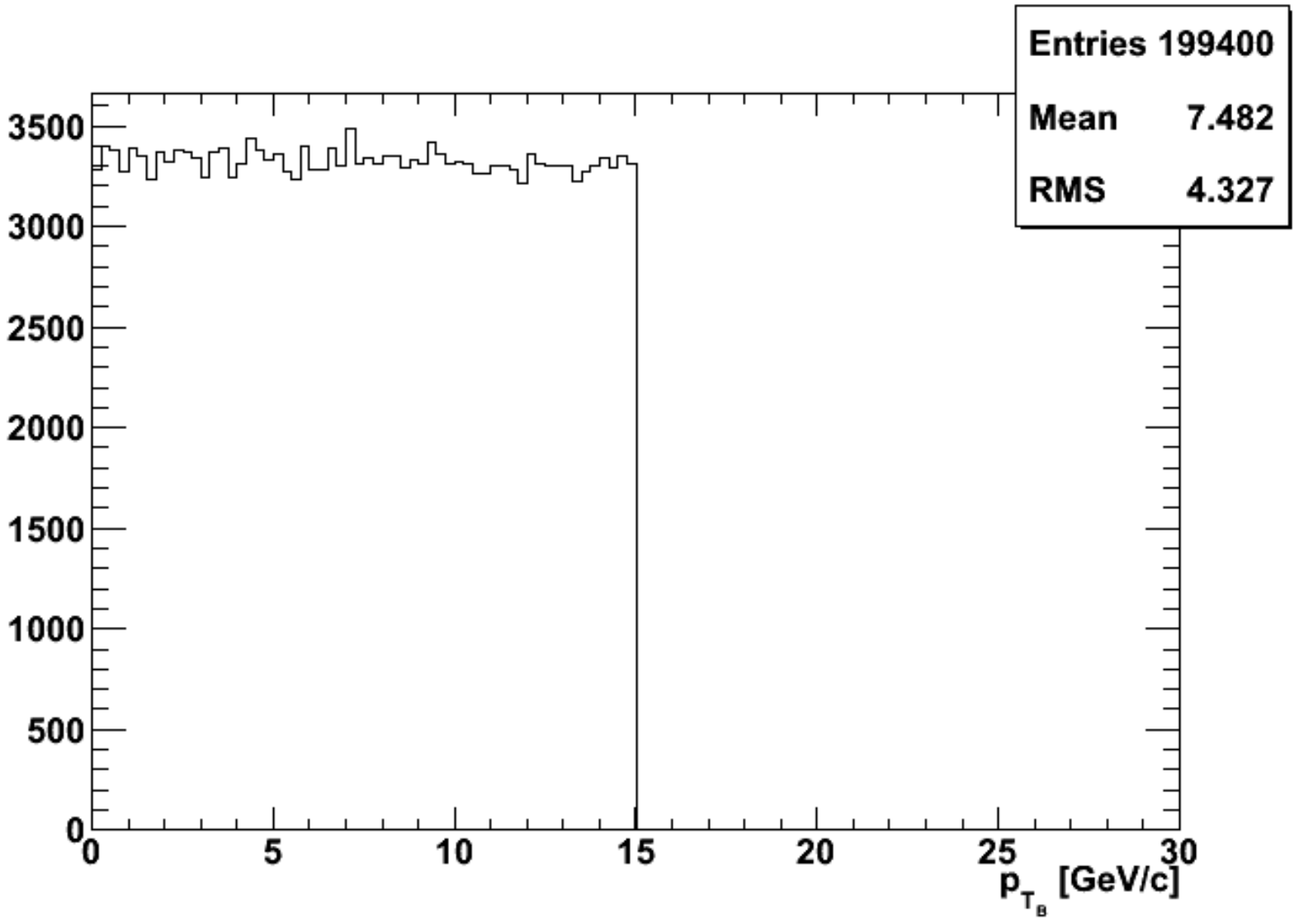
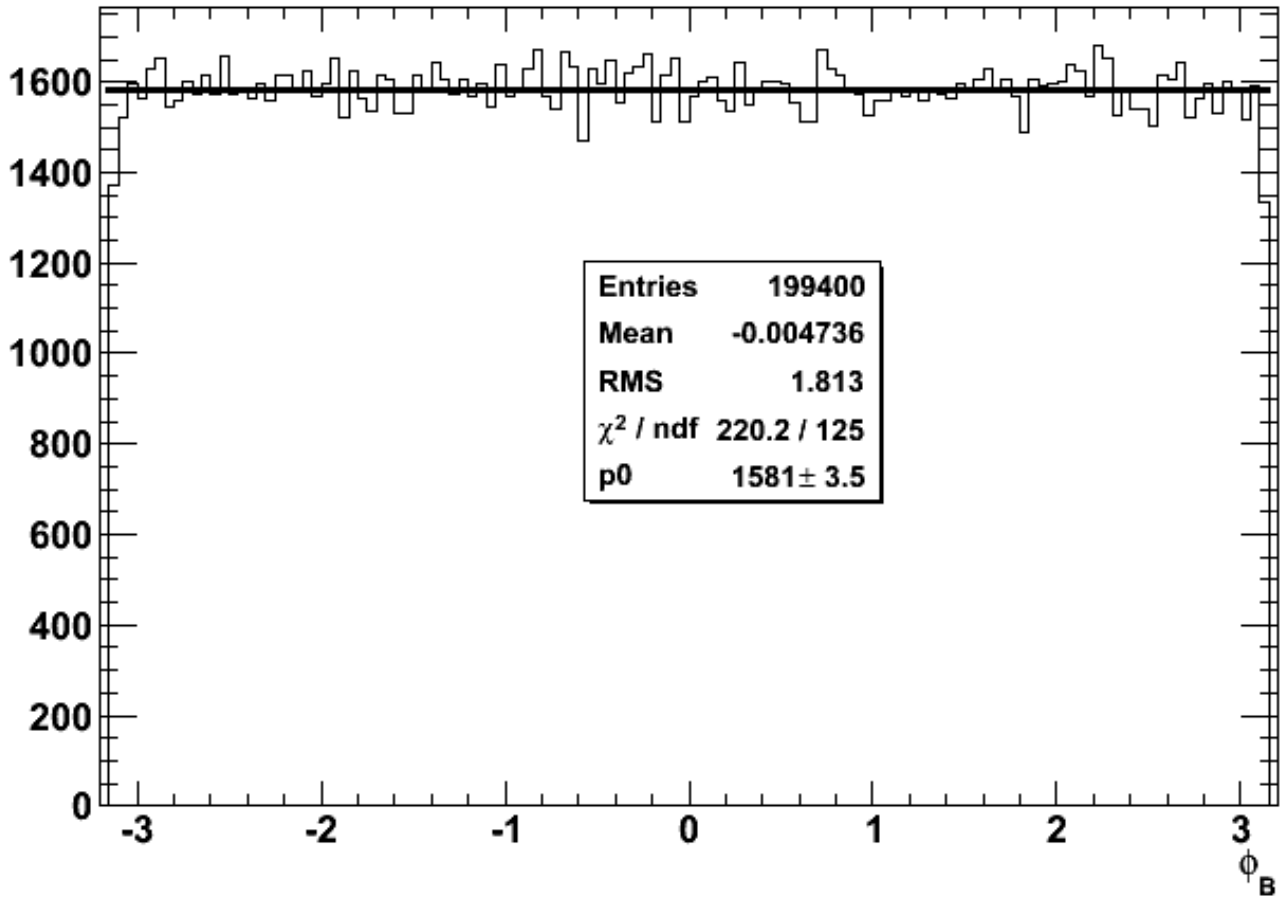
Initial QA of Embedding

- Lijuan pointed us to embedded output files by Yifei Zhang
- The embedded files contain 200 K events. Each event has embedded into it 1 of each:
  - $B^+ \rightarrow J/\psi + K^+ \rightarrow \mu^+ + \mu^- + K^+$
  - $J/\psi \rightarrow \mu^+ + \mu^-$
  - $\eta \rightarrow \mu^+ + \mu^- + \gamma$
  - $\Sigma^+ \rightarrow \mu^+ + \mu^- + p$
- Goal is to do some initial QA on the embedded output.
- Yifei also provided us with some initial code to read the embedded output. This code does not yet include MTD output information or reconstructed timing information.
- Next step will be to add MTD info.

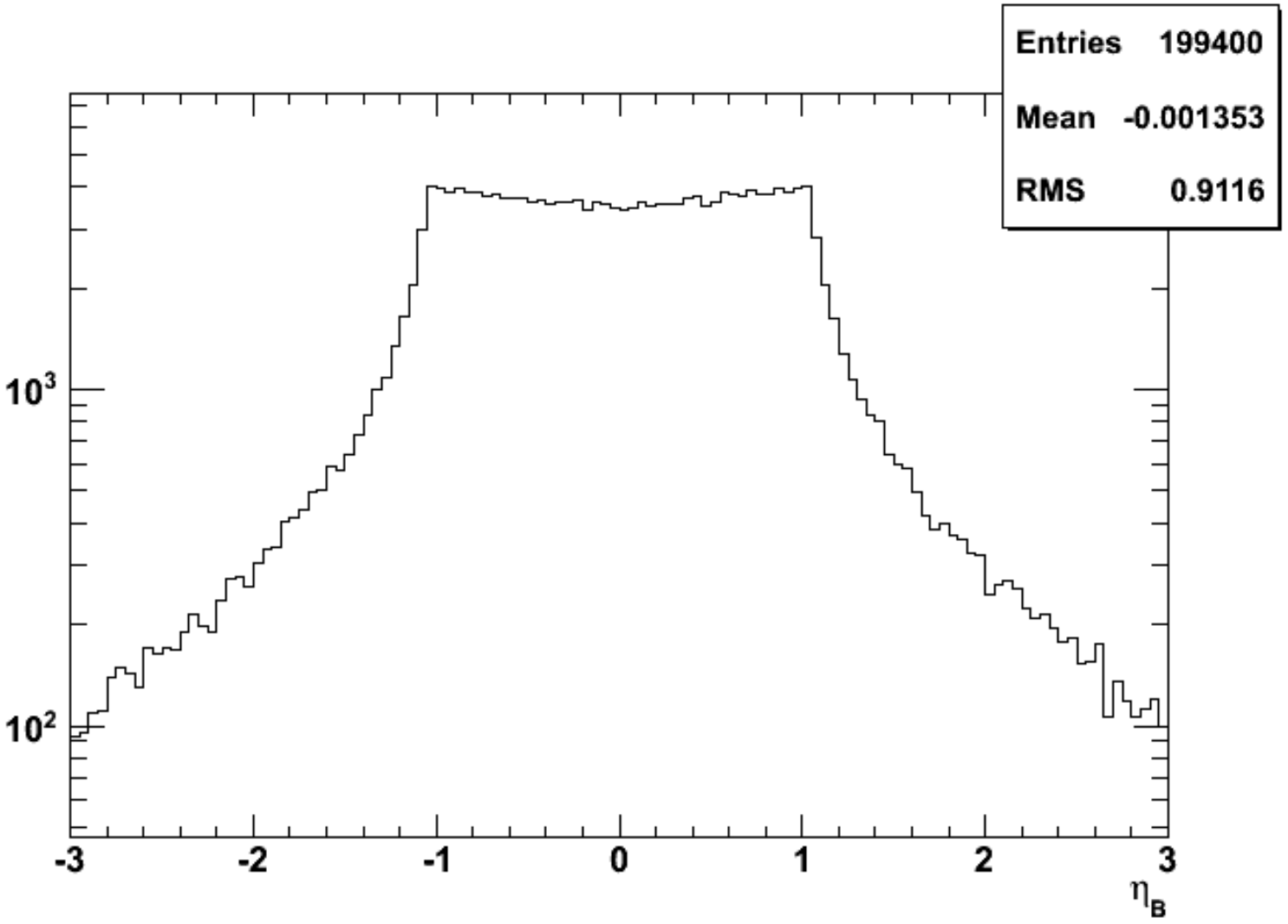
Transverse momentum distribution of the embedded B meson



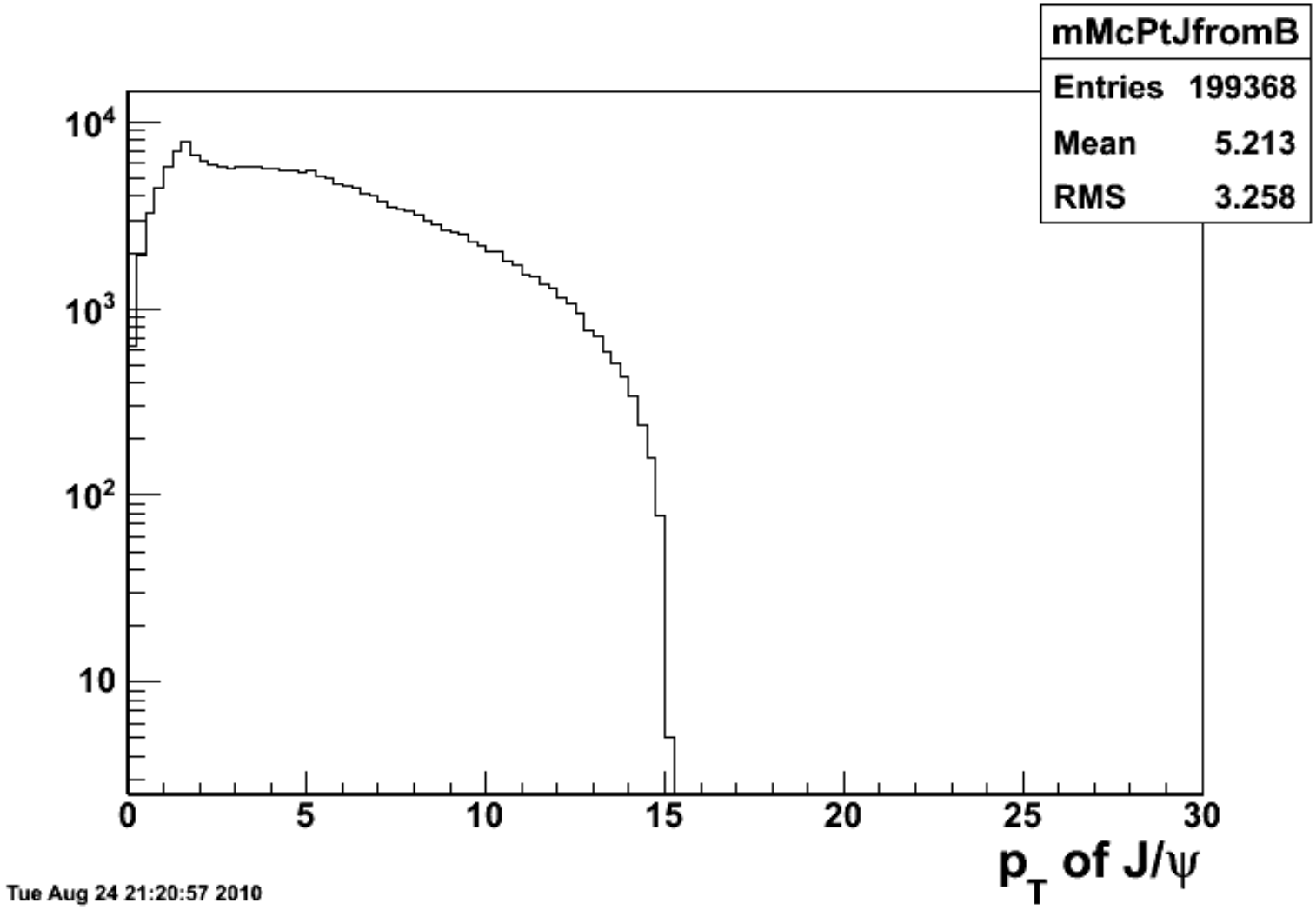
Azimuthal Angle Distribution of the embedded B meson



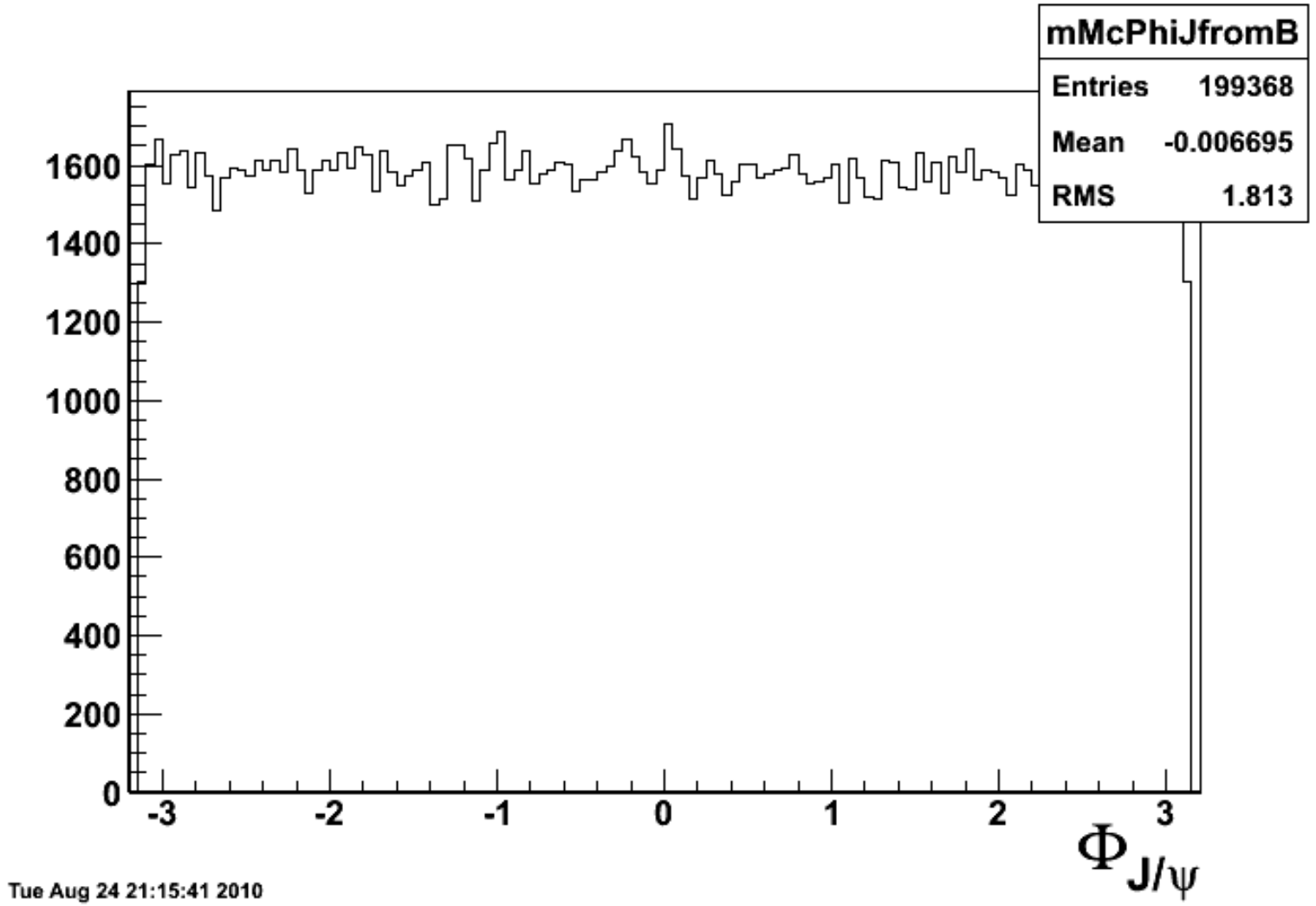
Pseudorapidity distribution of the embedded B meson



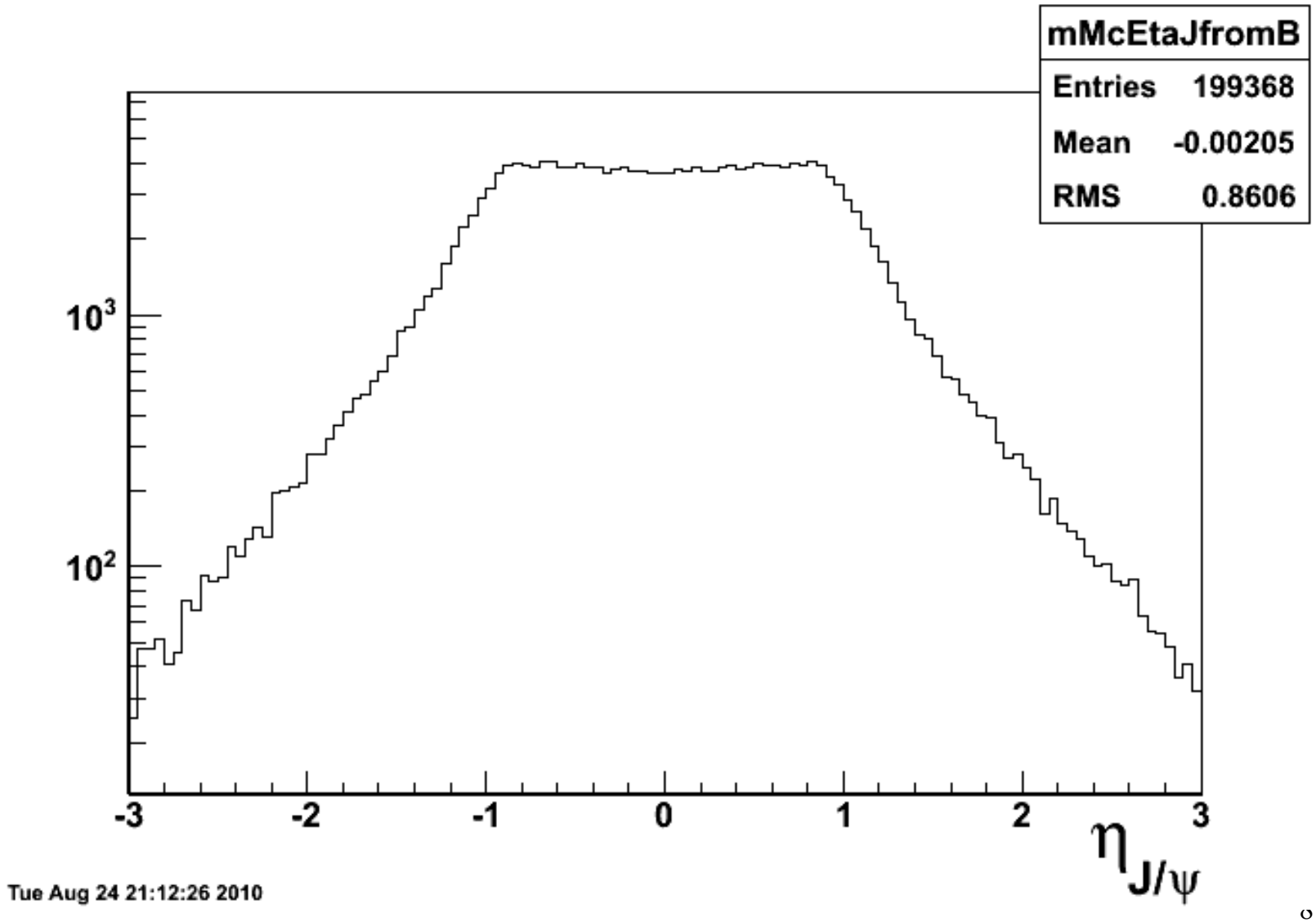
Transverse momentum distribution of the simulated J/ψ from B decay



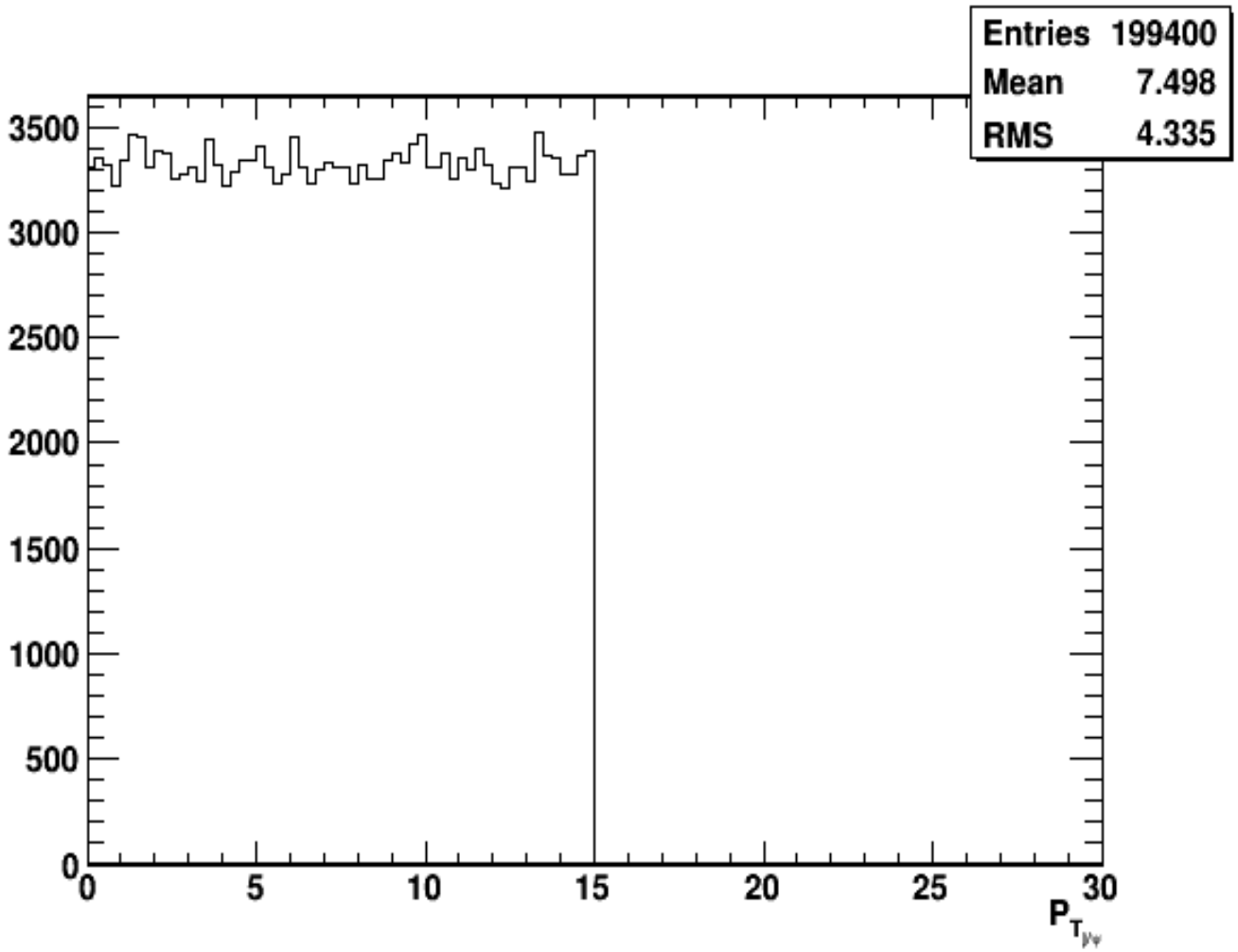
Azimuthal Angle distribution of the simulated J/ψ from B decay



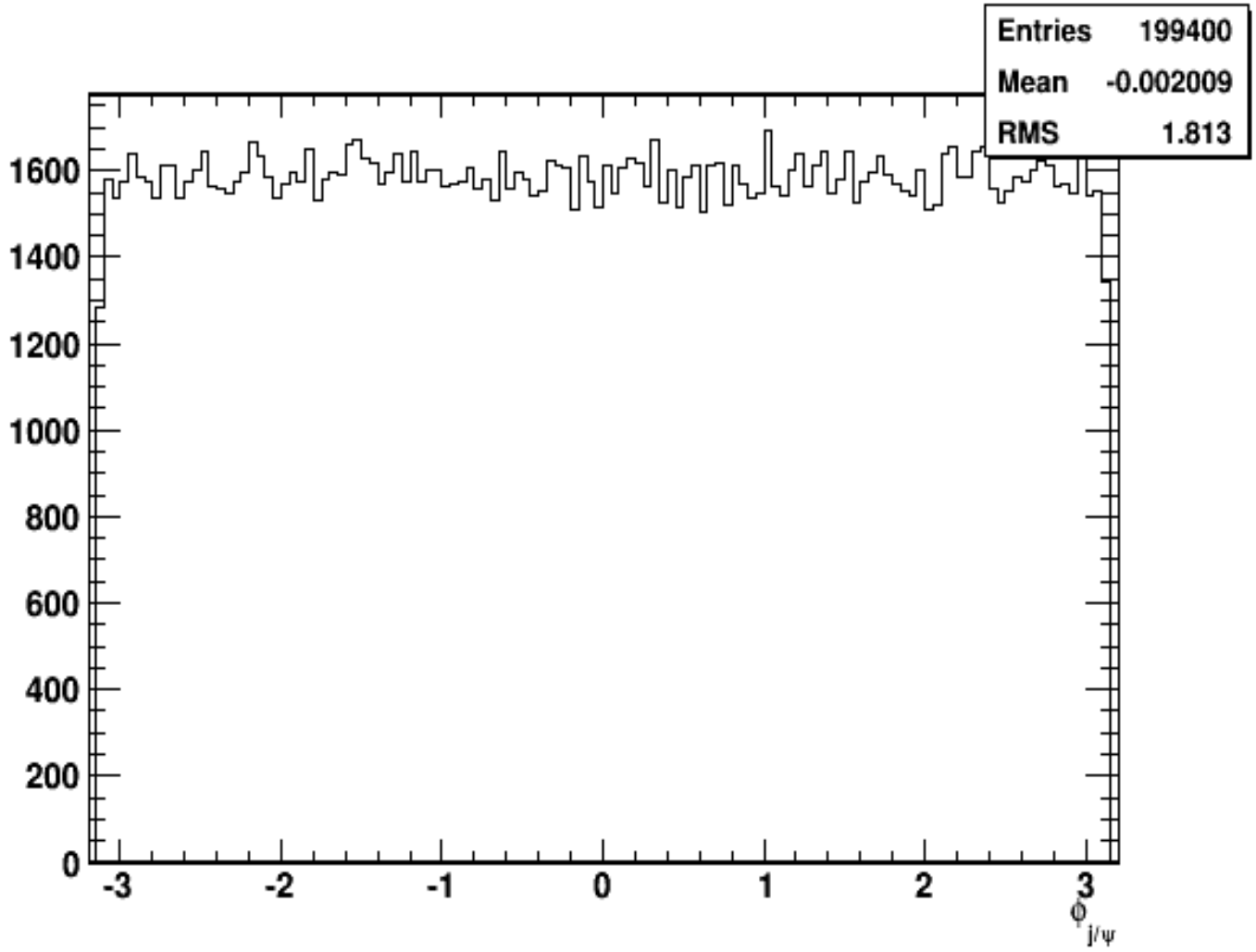
Pseudorapidity distribution of the simulated J/ψ from B decay



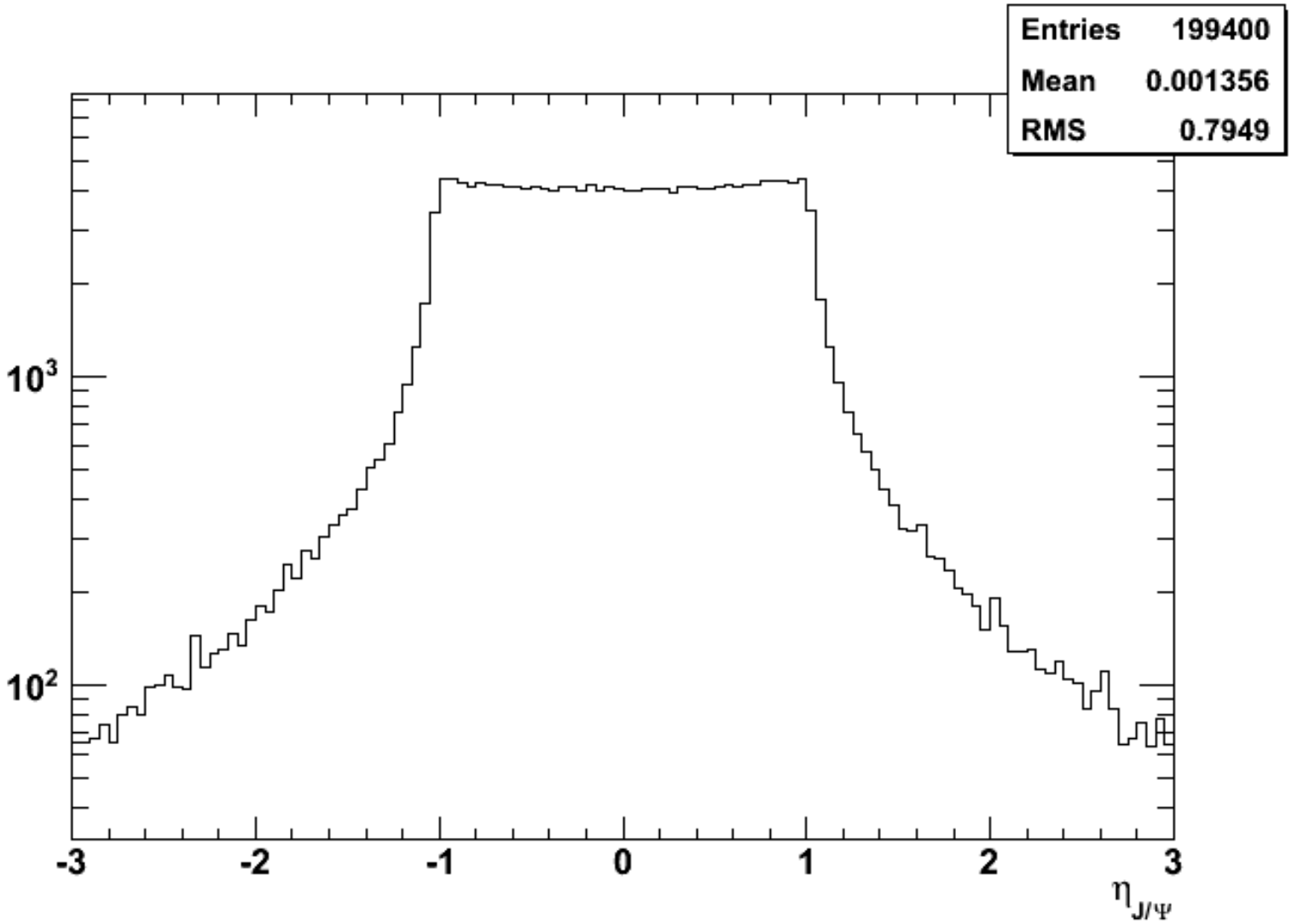
Transverse momentum distribution of J/Ψ (not from B)



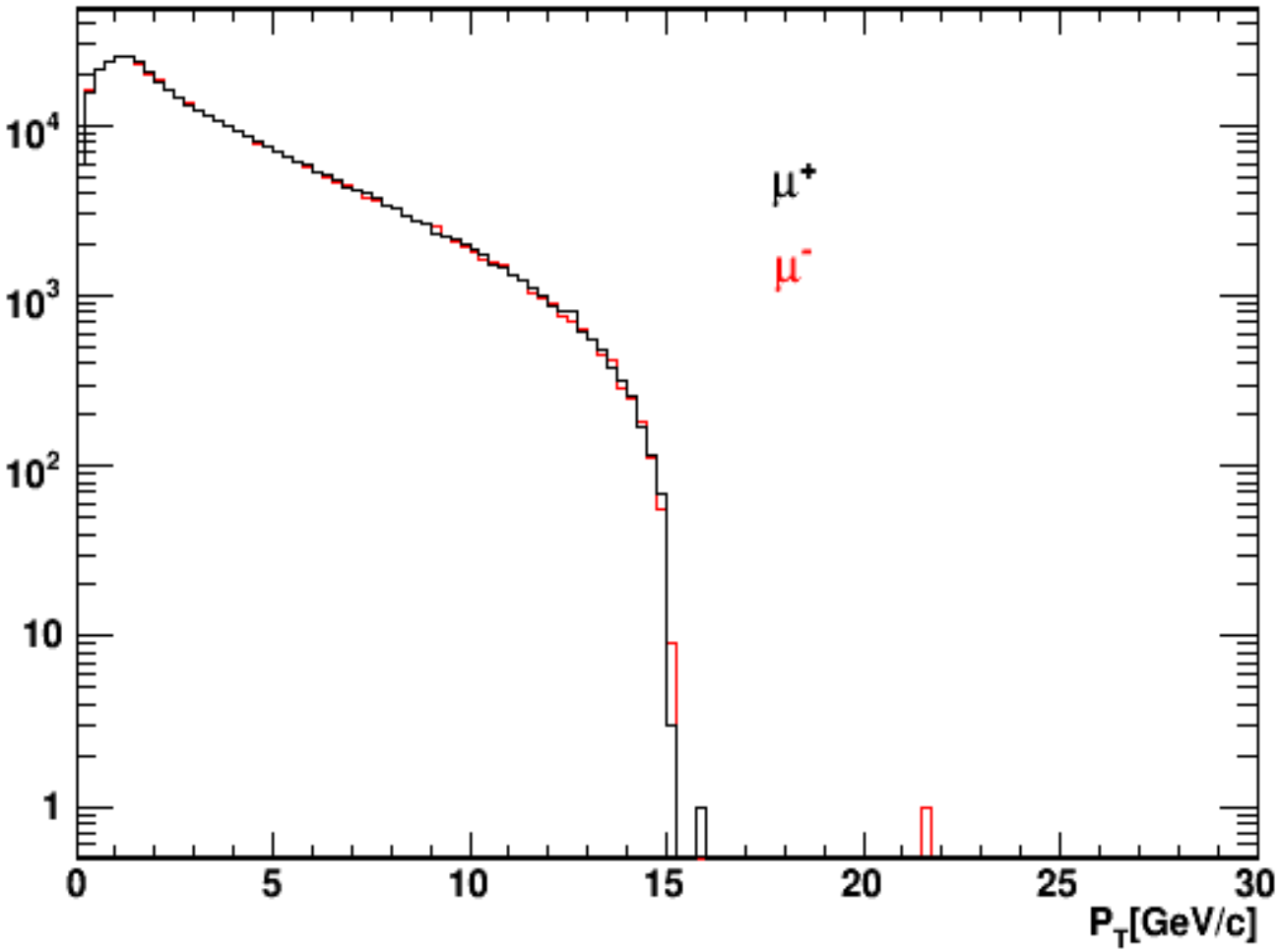
Azimuthal Angle distribution of the simulated J/ψ (not from B)



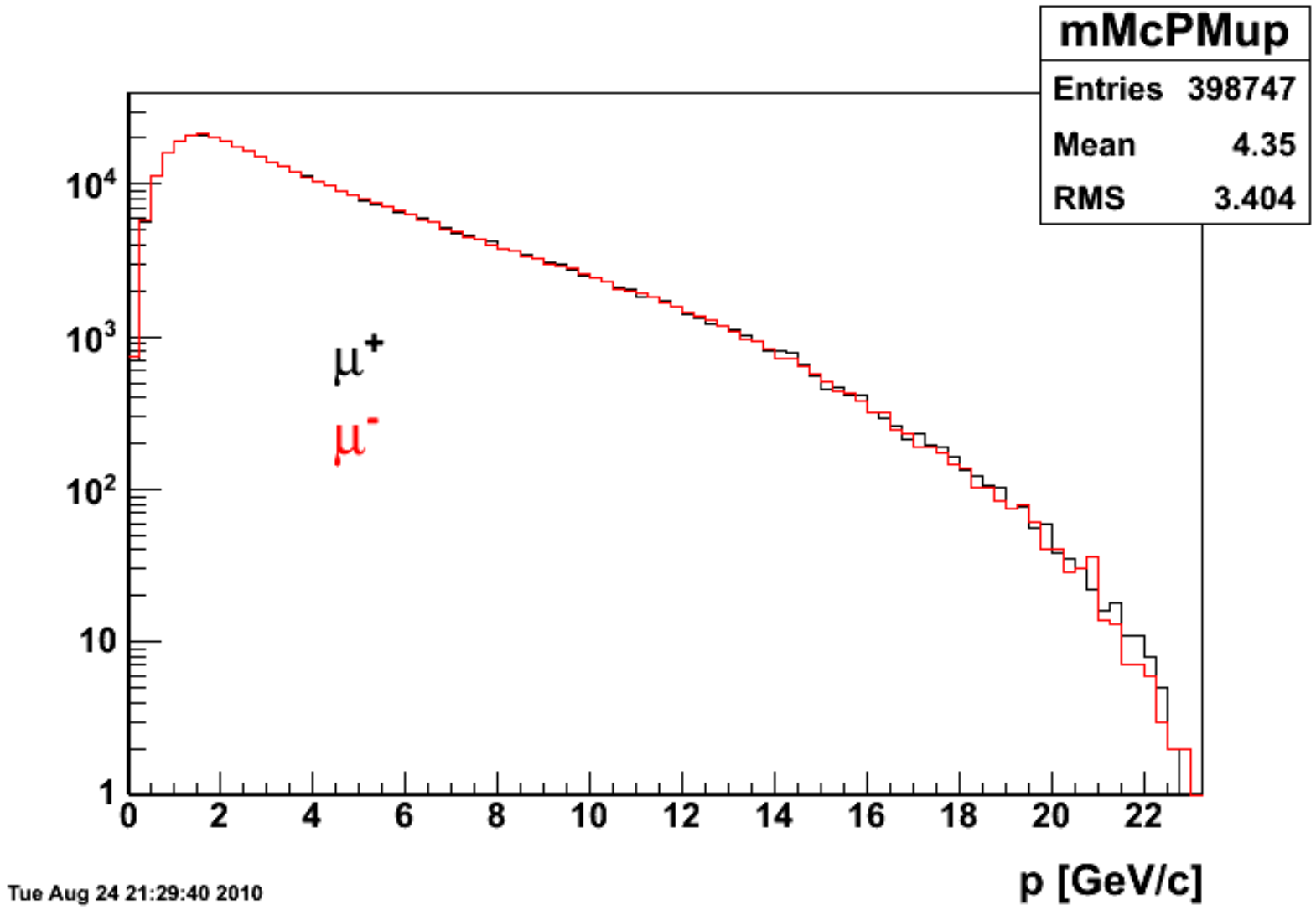
Pseudorapidity distribution of the simulated J/ψ (not from B)



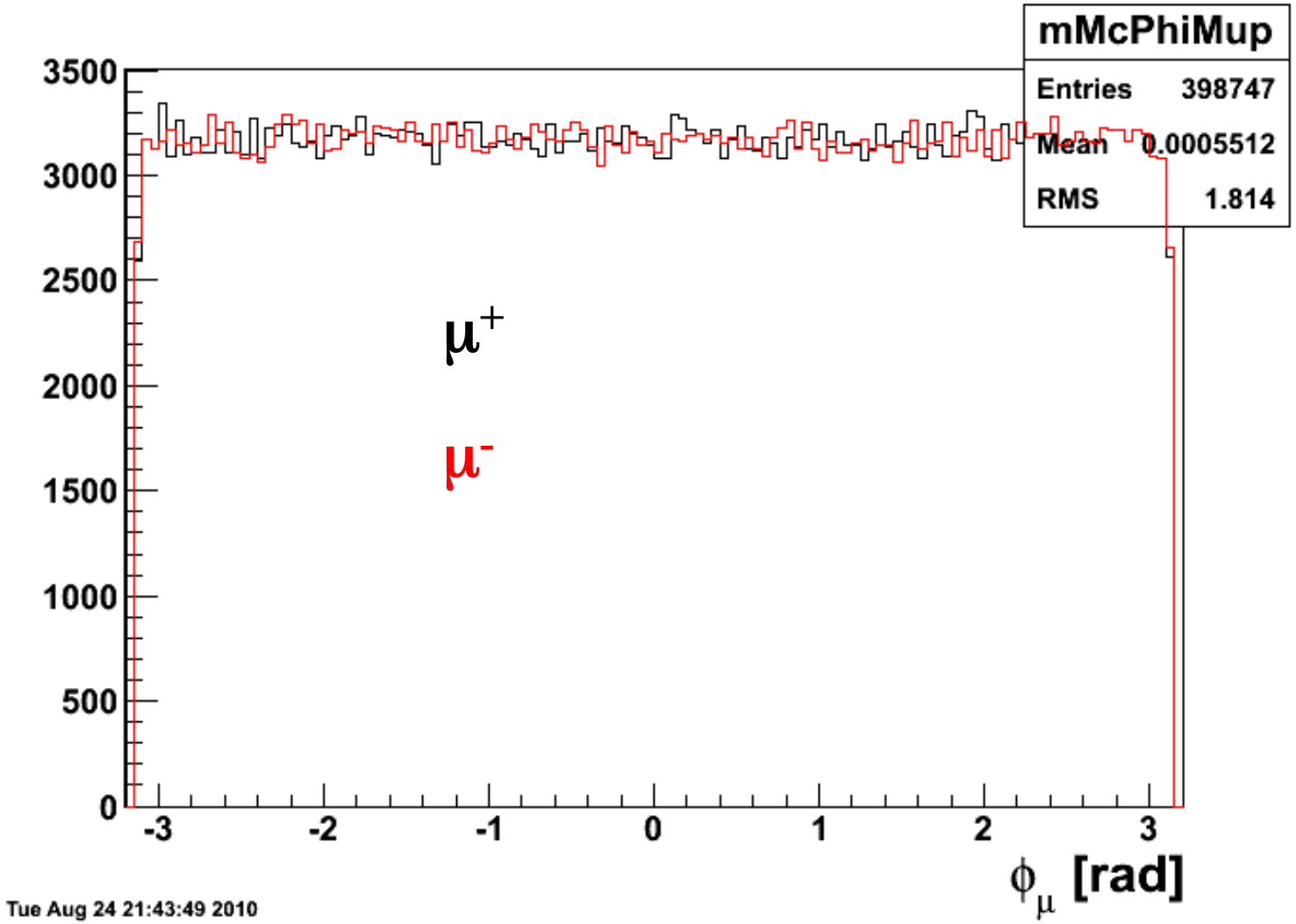
Transverse momentum distributions of the daughter $\mu^{\pm}$



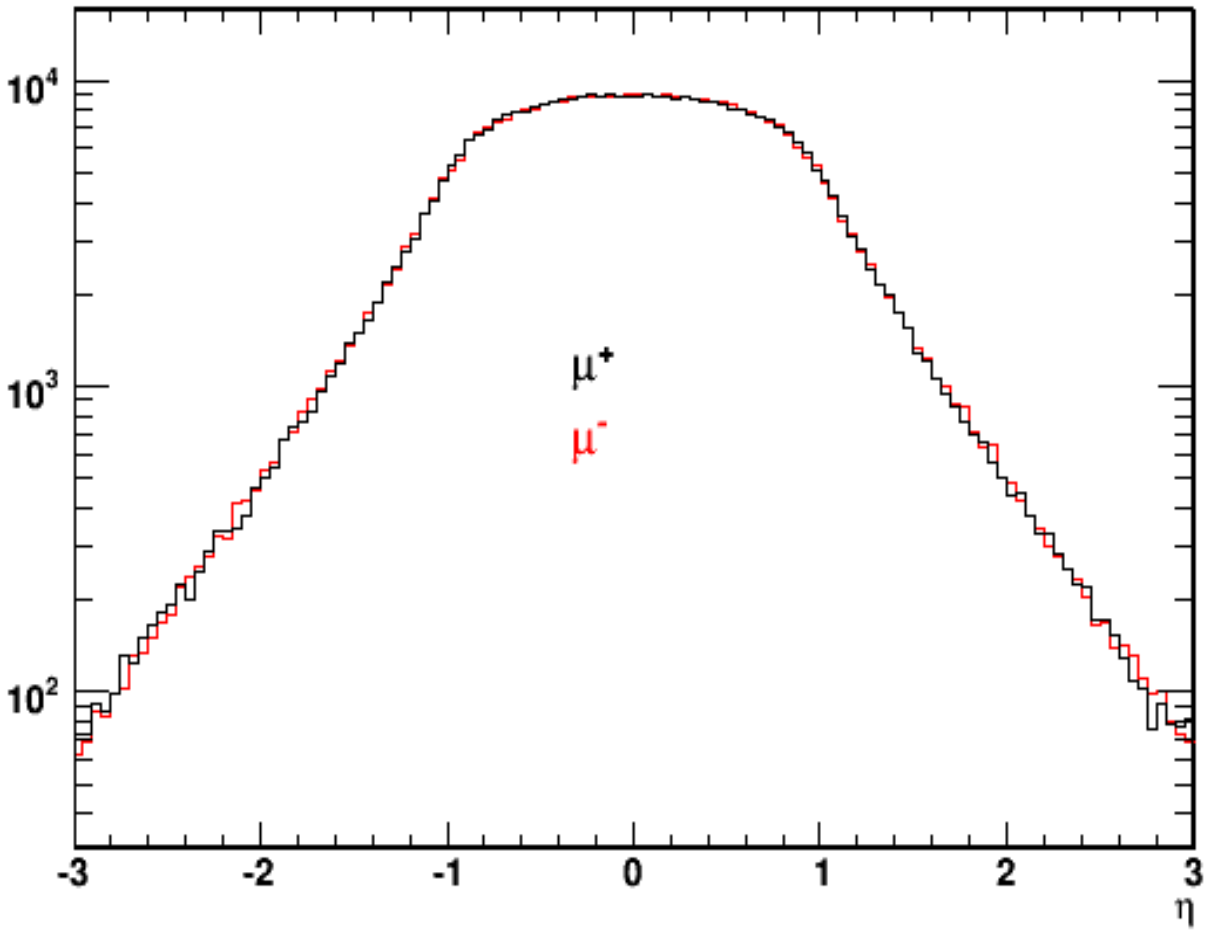
(Total) Momentum distributions of the daughter $\mu^{\pm}$



Azimuthal Angle distributions of the daughter $\mu^{\pm}$

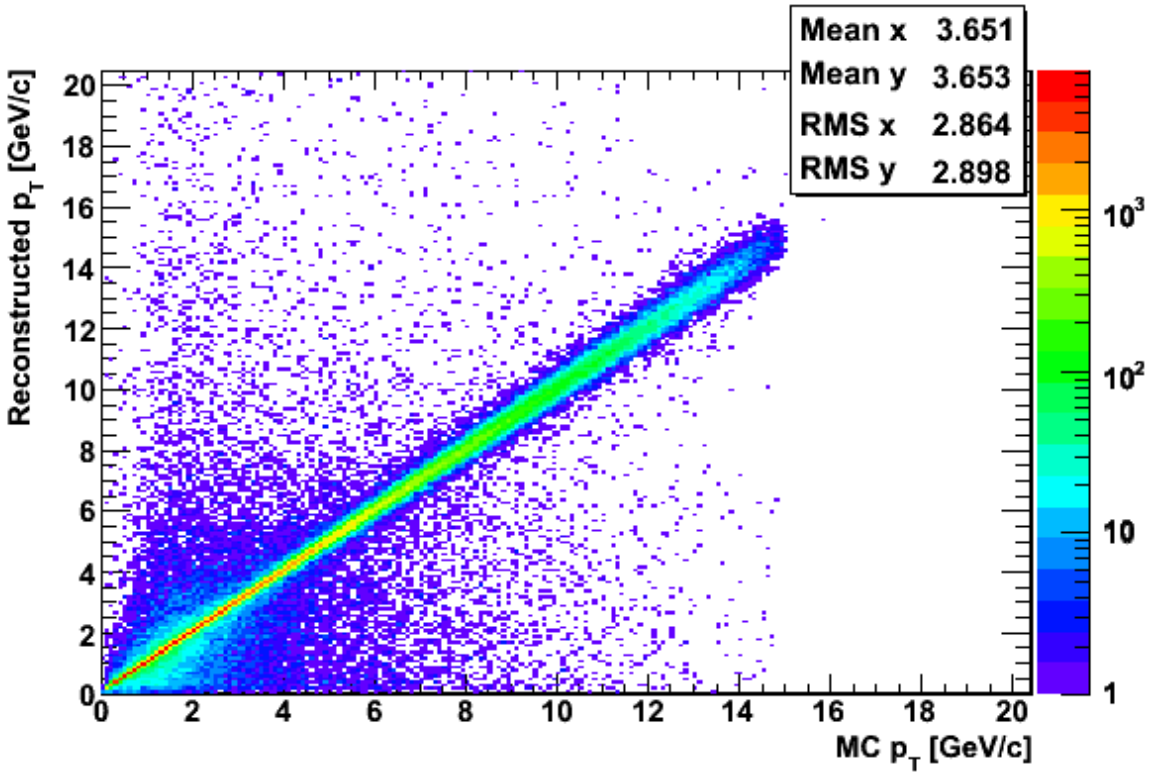


Pseudorapidity distributions of the daughter $\mu^{\pm}$



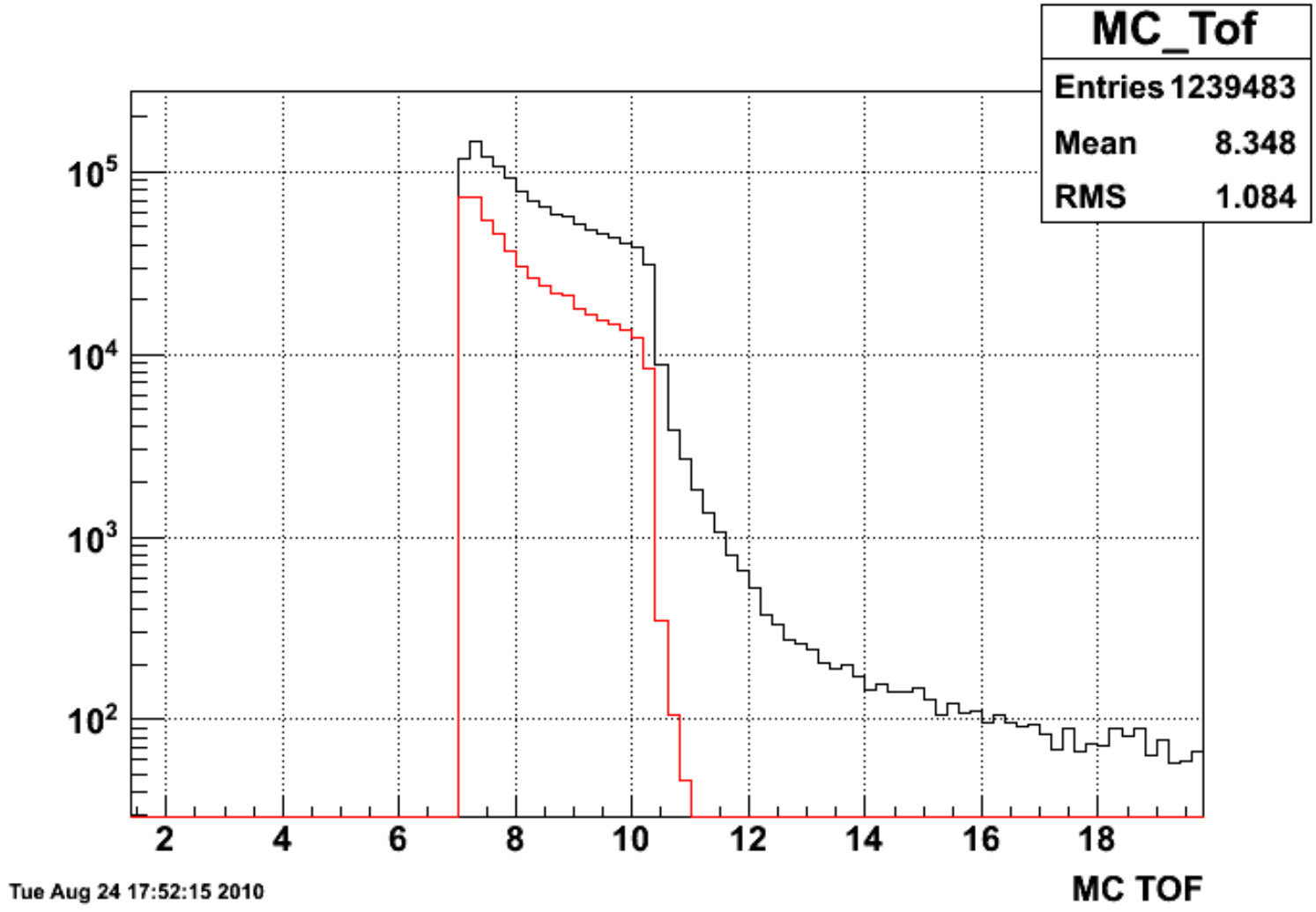
Reconstructed p_T vs. Simulated p_T of daughter $\mu^{\pm}$

No pseudorapidity cut, no primary vertex cut, no dca cut

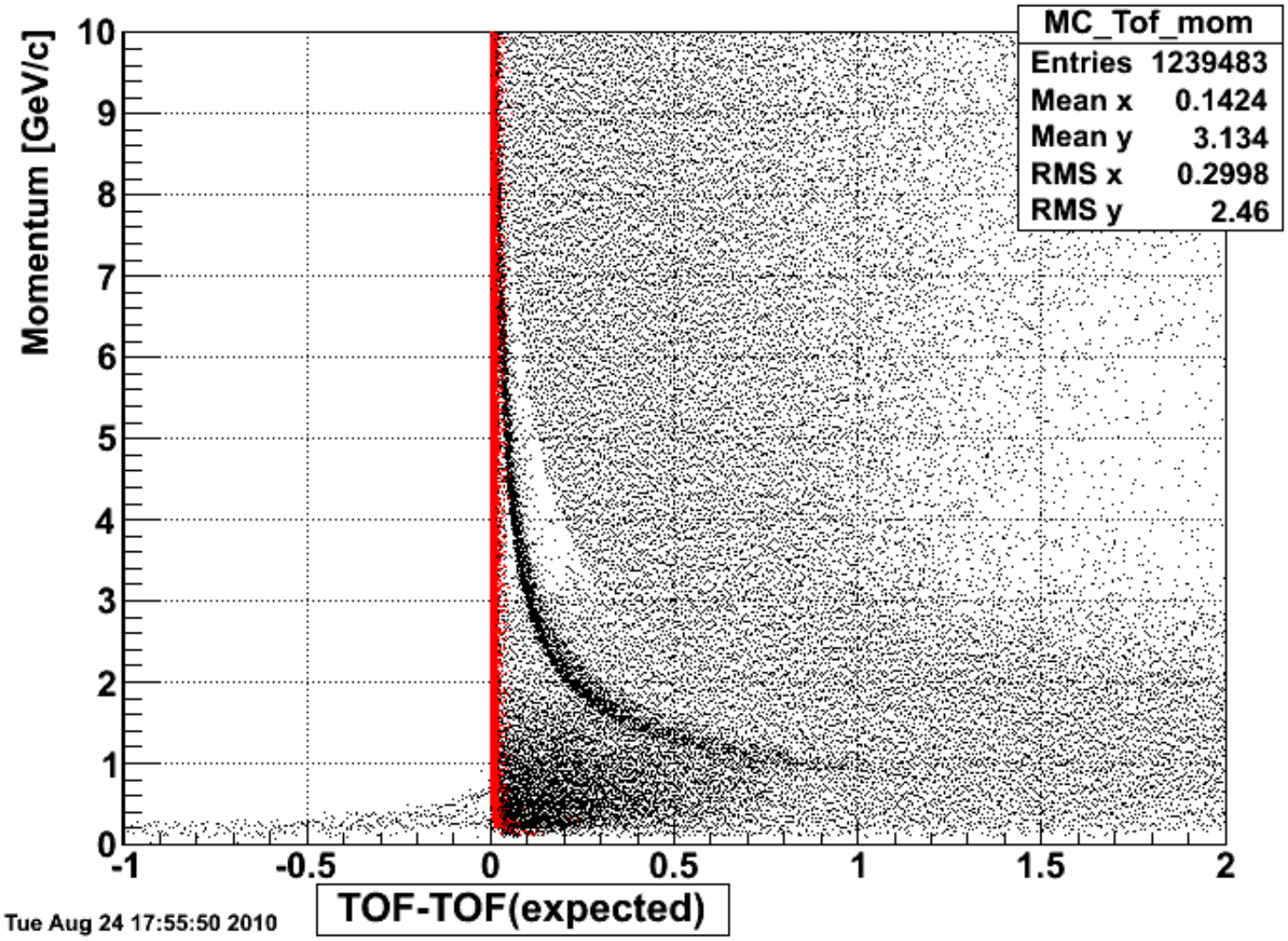


Roughly 90% of simulated daughter muons are reconstructed

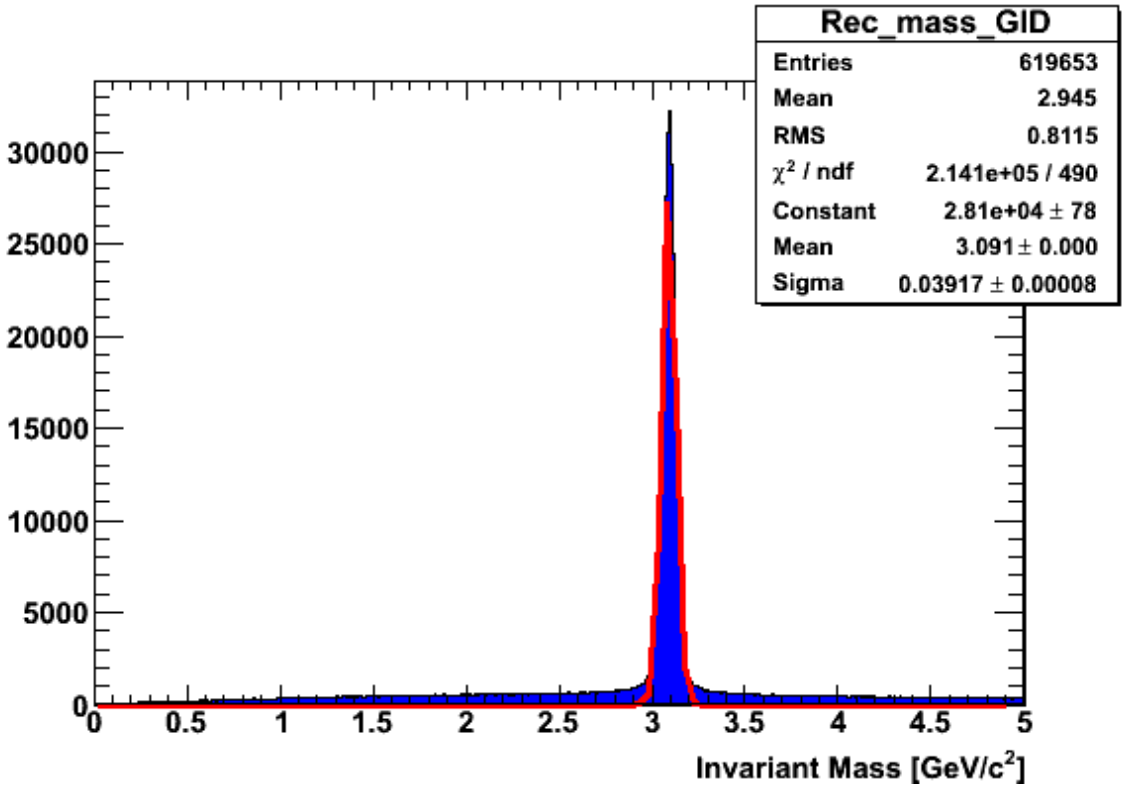
Monte-Carlo TOF for all reconstructed MCtracks (muons in red)



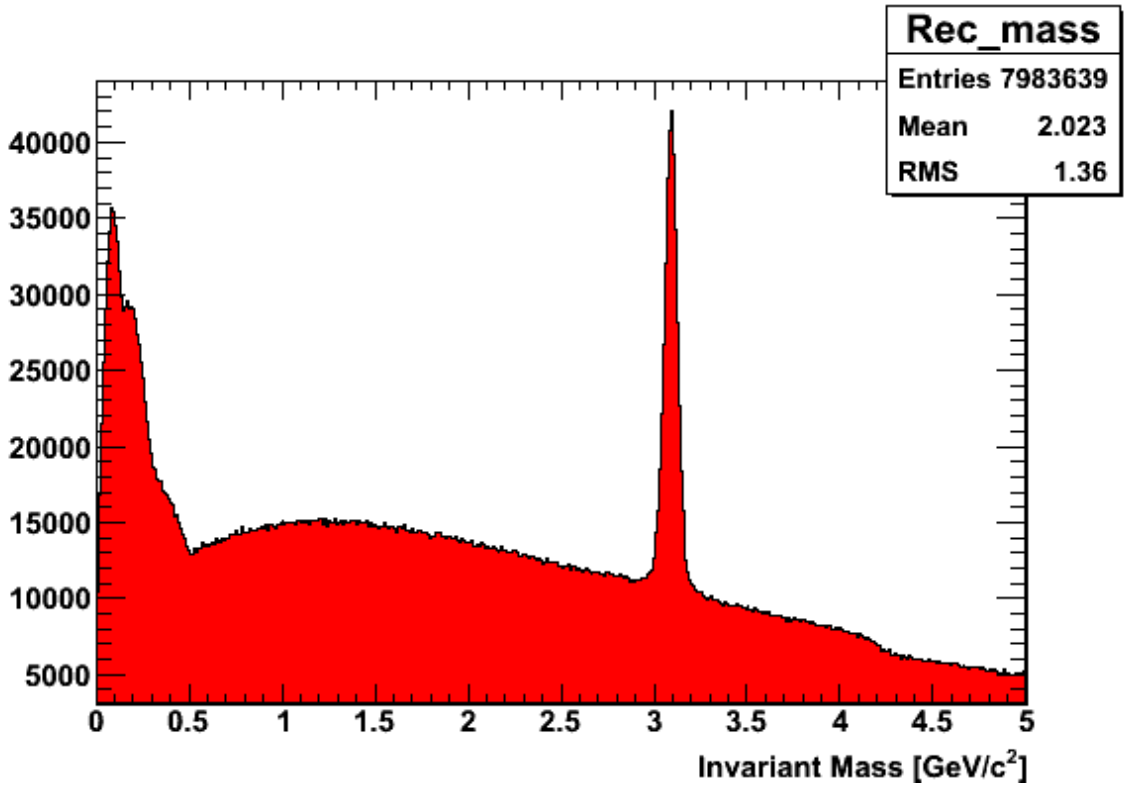
Monte-Carlo Momentum vs (TOF-TOFexpected) assuming muon mass for all reconstructed MCtracks (and muons in red)



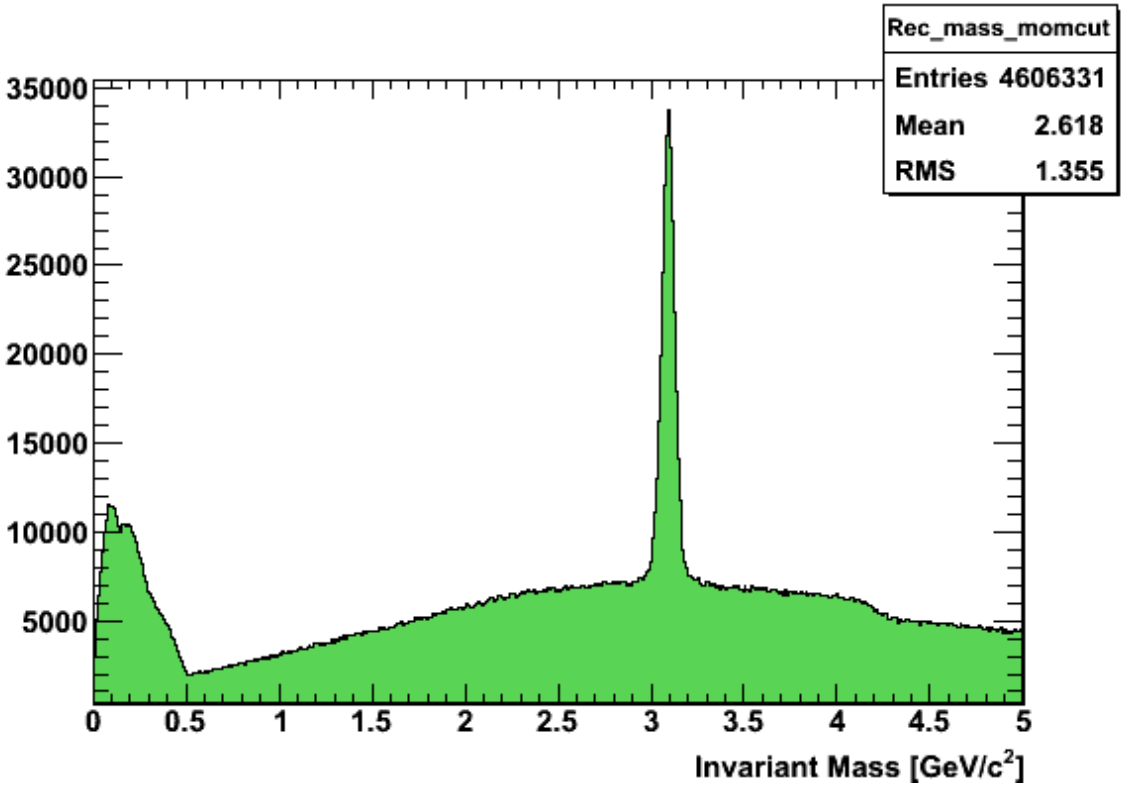
Reconstructed Invariant mass for pairs of μ^+ and μ^- (with knowledge of Geant ID)



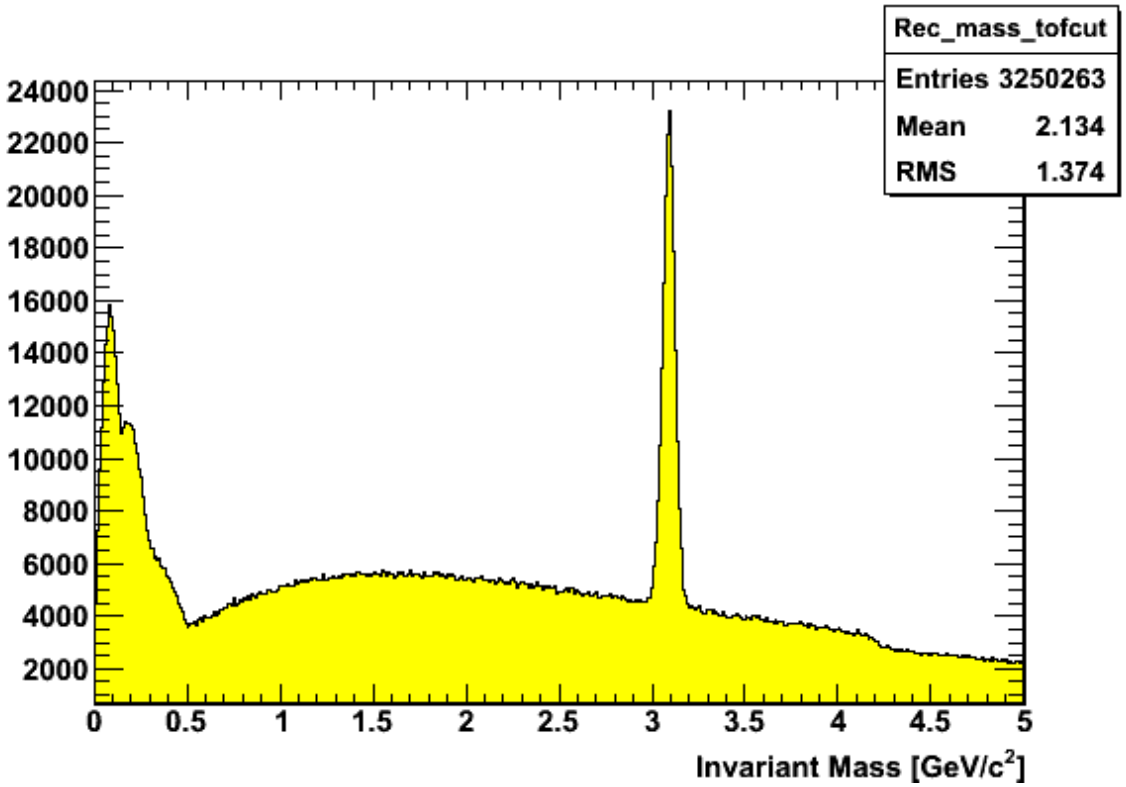
Reconstructed Invariant mass for all pairs of reconstructed tracks (without knowledge of Geant ID)



Reconstructed Invariant mass for all pairs of reconstructed tracks with (reconstructed) momentum cut of 1 GeV/c



Reconstructed Invariant mass for all pairs of reconstructed tracks with (Monte-Carlo) TOF cut of 10 ps of expcted TOF (for muon mass)



Conclusions

- Initial QA of embedded output for $B^+ \rightarrow J/\psi + K^+$ has been performed
- Next step is to add timing information and MTD hit information