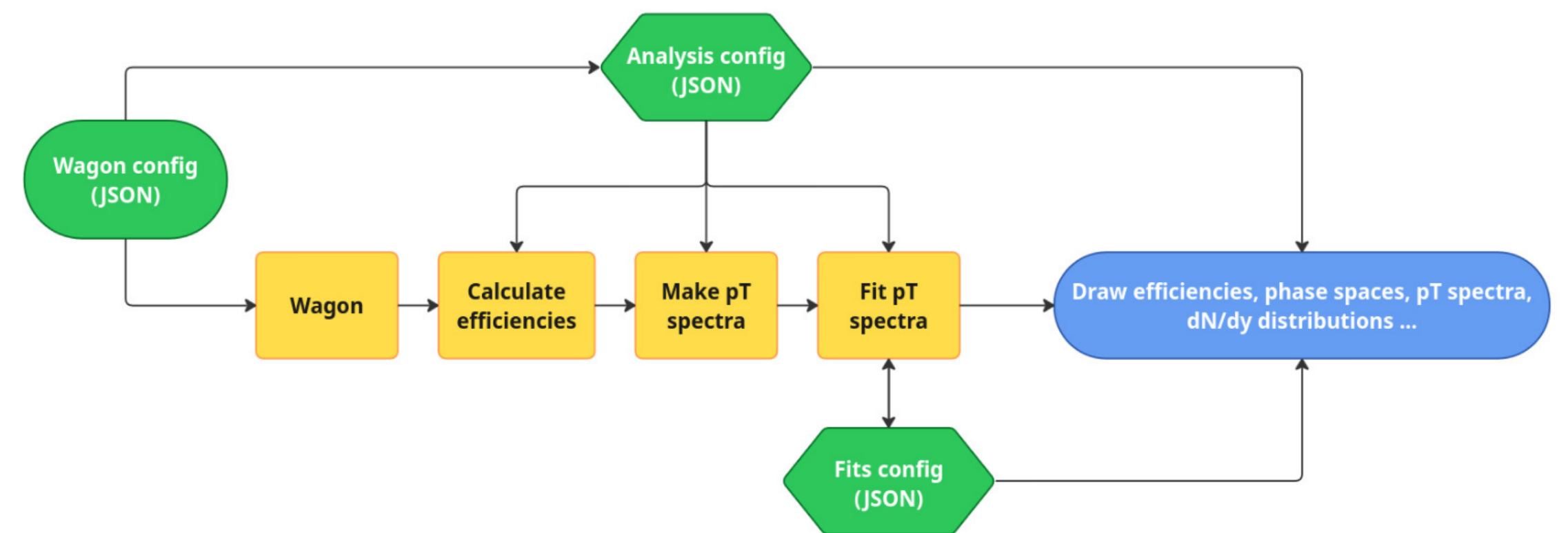


«Nuclei» wagon

Update



PID modes

- MpdPid class, max probability: dE/dx only
- MpdPid class, max probability: combined dE/dx and m^2

- MpdPid class, «Veto PID»: TPC-TOF
- MpdPid class, «Veto PID»: TOF-TPC
- evPID wagon, «Veto PID»: TPC-TOF
- evPID wagon, «Veto PID»: TOF-TPC

Old and known

New

«Veto» PID: TPC-TOF

- TPC-TOF

- TPC 2σ PID selection for a given specie (π , p)
- If track is 2σ -matched to TOF then TOF 2σ PID selection for a given specie (π , p)

- TPC-TOF

- TPC 1σ PID selection for a given specie (K)
- If track is 2σ -matched to TOF then TOF 1σ PID selection for a given specie (K)
- TPC 3σ veto-PID for other species (for K : $e/\pi/p$ veto)

See M. Malaev slides:

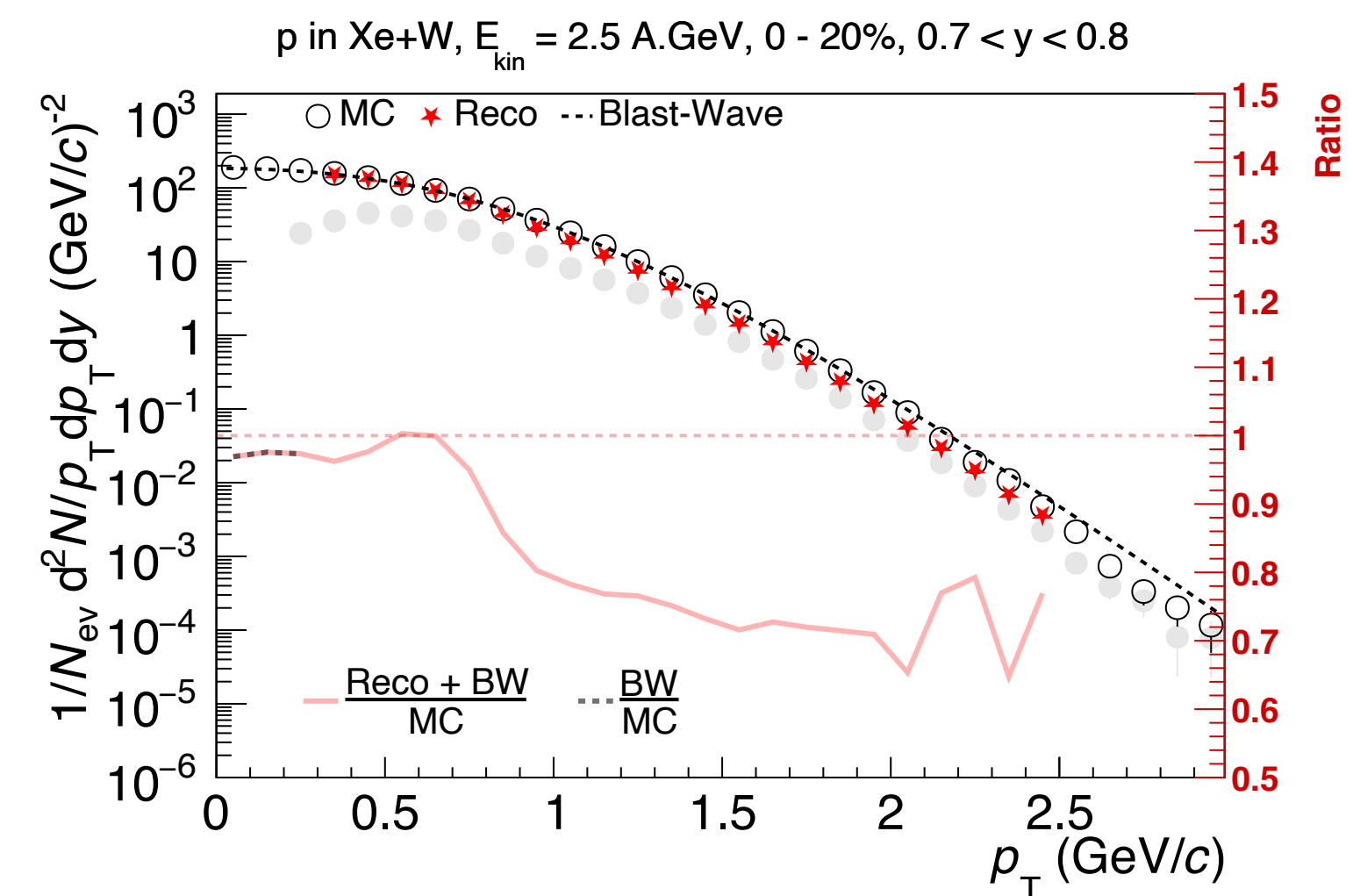
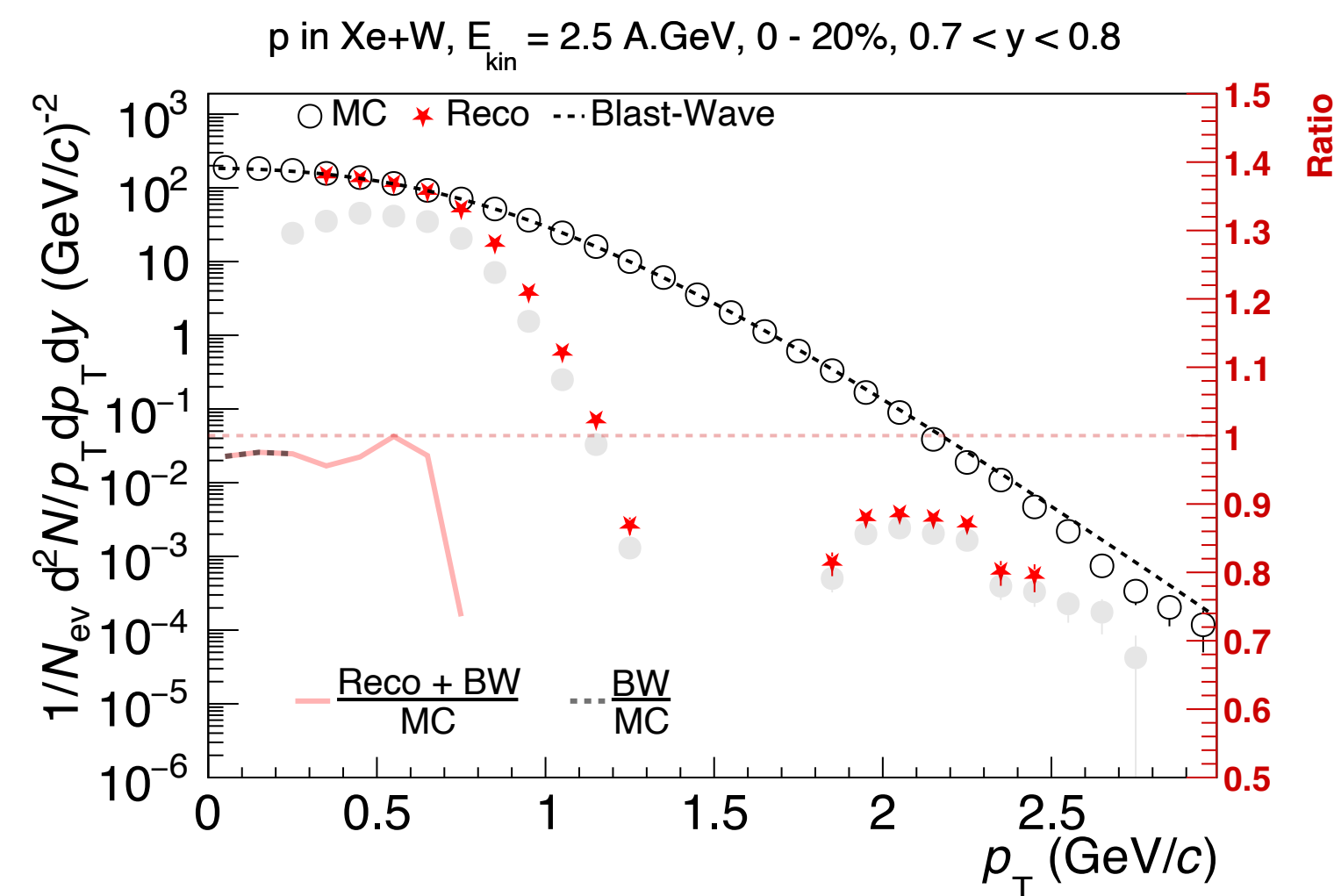
https://indico.jinr.ru/event/5313/contributions/30786/attachments/21958/38740/PiKP_MalaevM_010425.pdf

https://indico.jinr.ru/event/5424/contributions/31340/attachments/22339/39461/PiKP_MalaevM.pdf

«Veto» PID: TPC-TOF

- TPC-TOF in «nuclei» wagon
 - TPC **$N\sigma$** PID selection for a given specie
 - If track is 2σ -matched to ToF then ToF **$N\sigma$** PID selection for a given specie
 - TPC **$N\sigma$** veto-PID for other species
 - ToF **$N\sigma$** veto-PID for other species if track is 2σ -matched to ToF

Plots for evPID wagon!

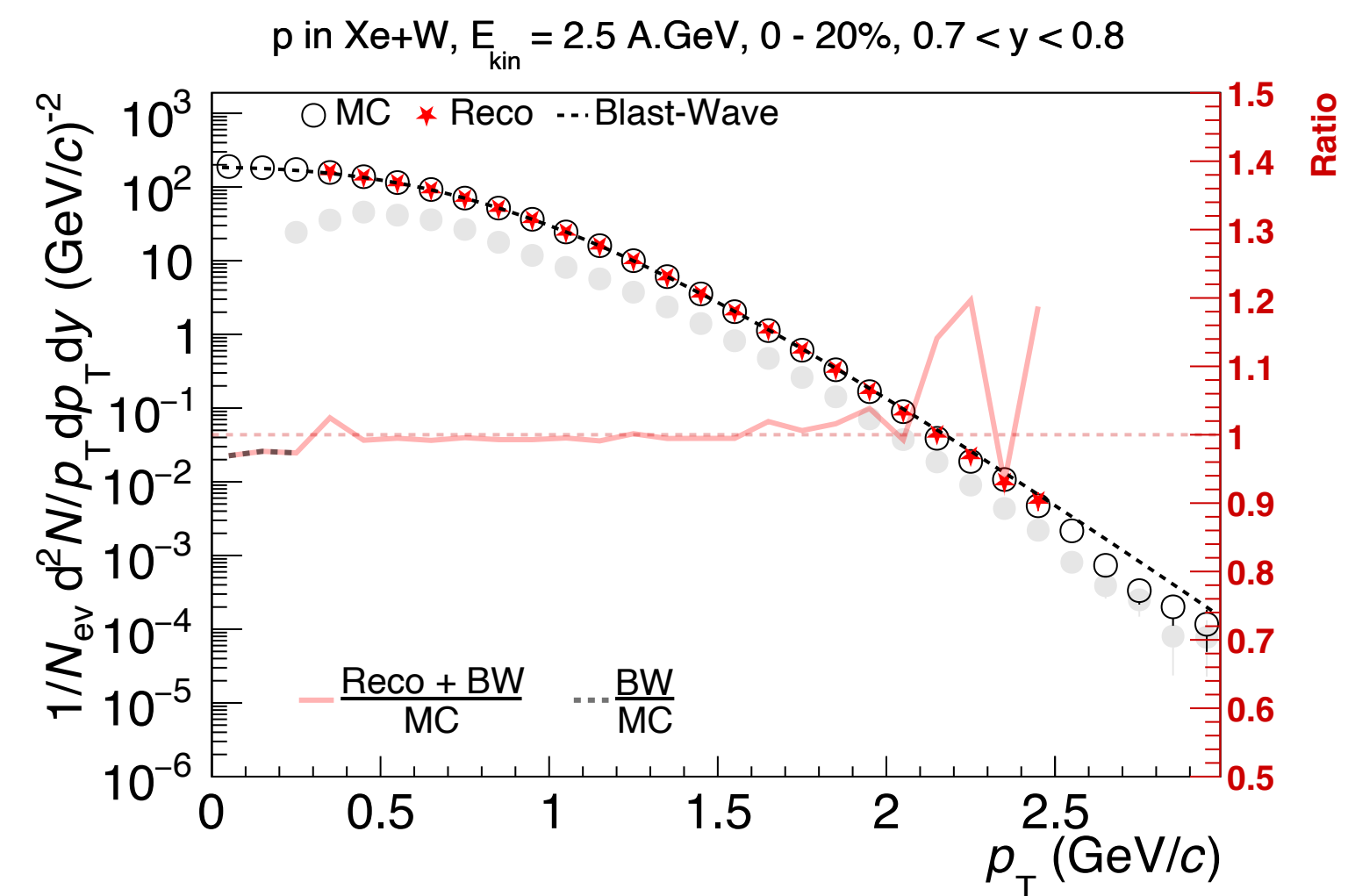
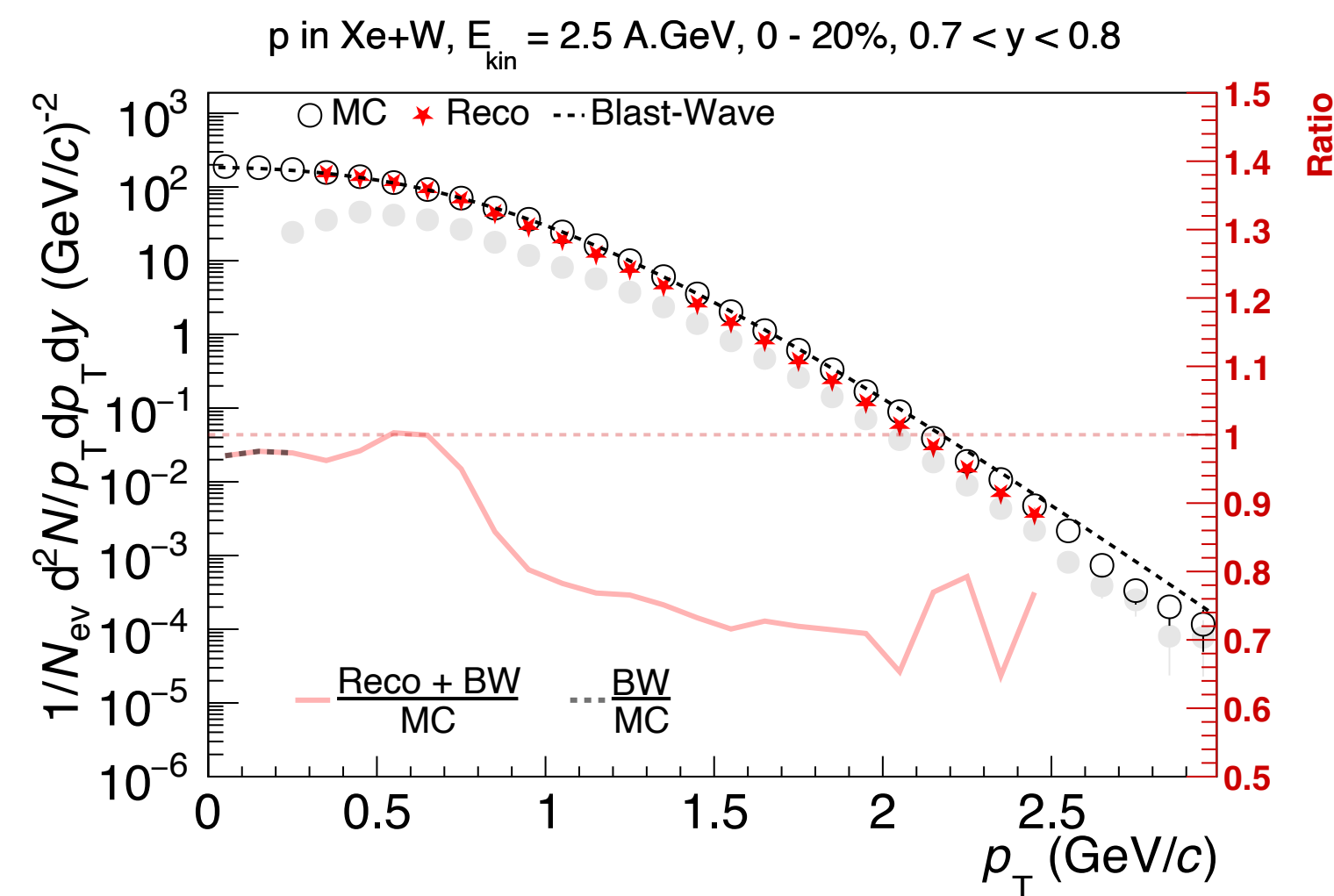


«Veto» PID: TPC-TOF

- PID efficiency correction

- $N\sigma$ correction does not count particles rejected by the «veto»
- Use the «standard» MpdPid class way to calculate «Veto PID» efficiency?

Plots for evPID wagon!

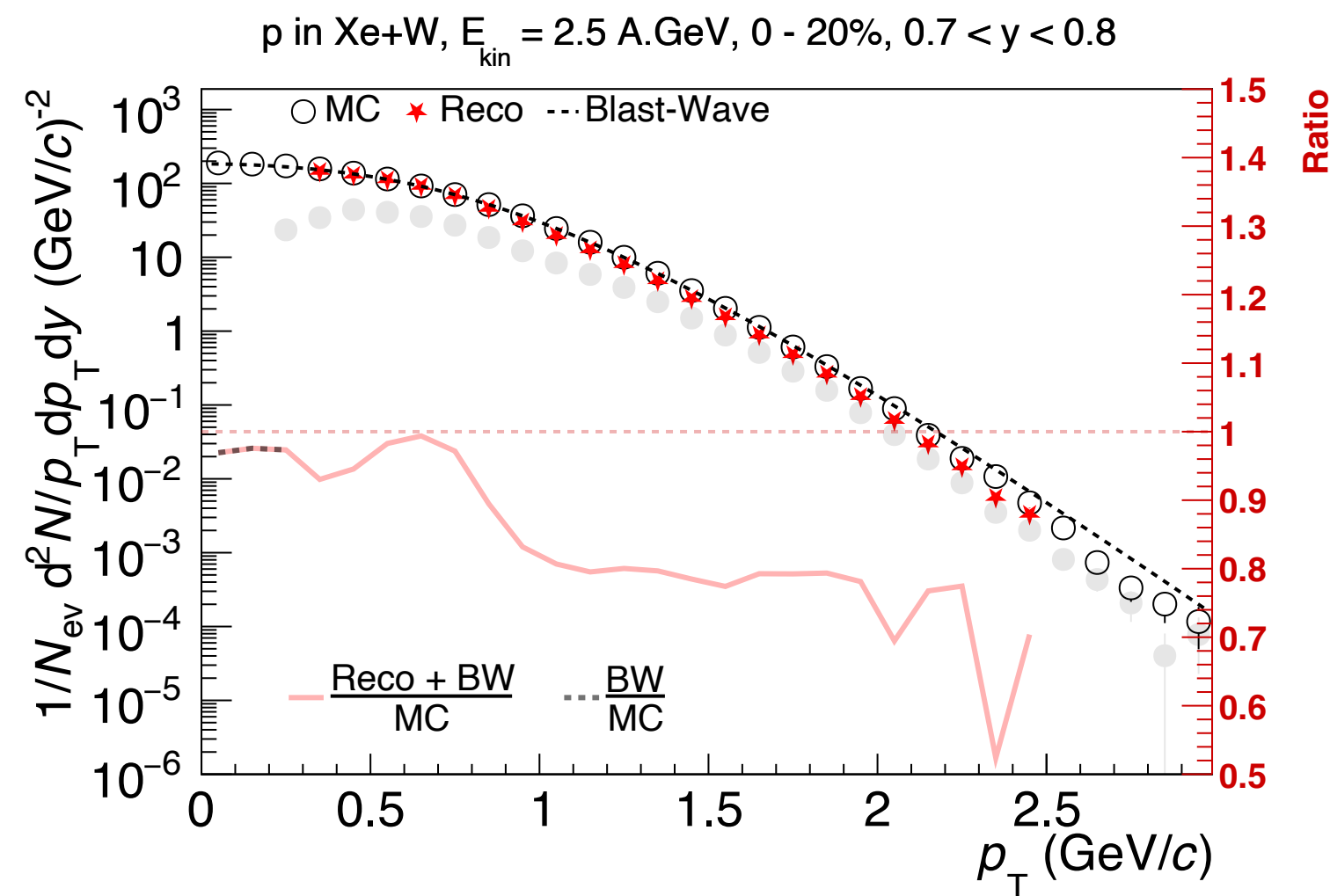


«Veto» PID: merging

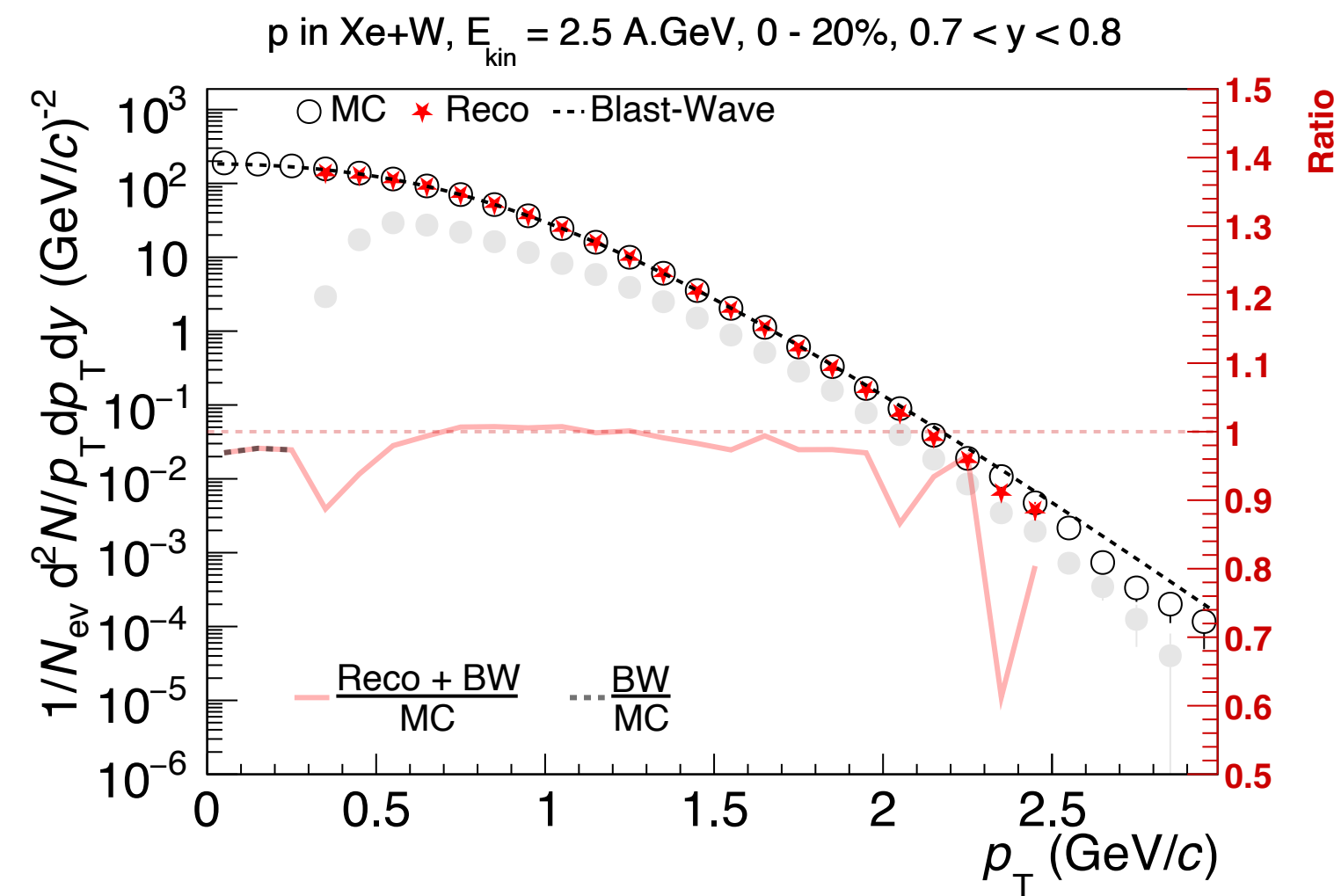
- The idea is to merge TPC-TOF and TOF-TPC spectra

Plots for MpdPid class!

TPC-TOF



TOF-TPC



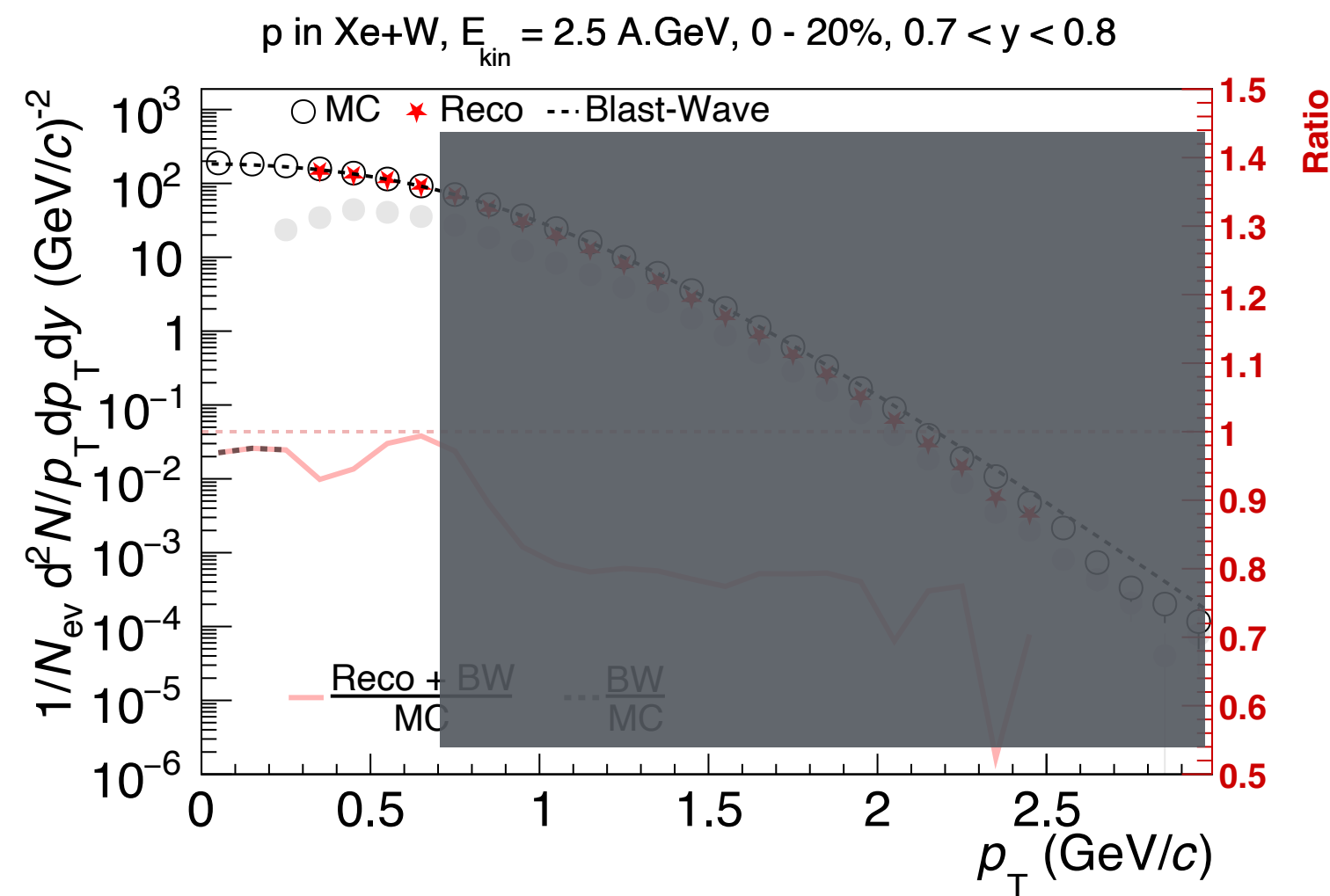
+

«Veto» PID: merging

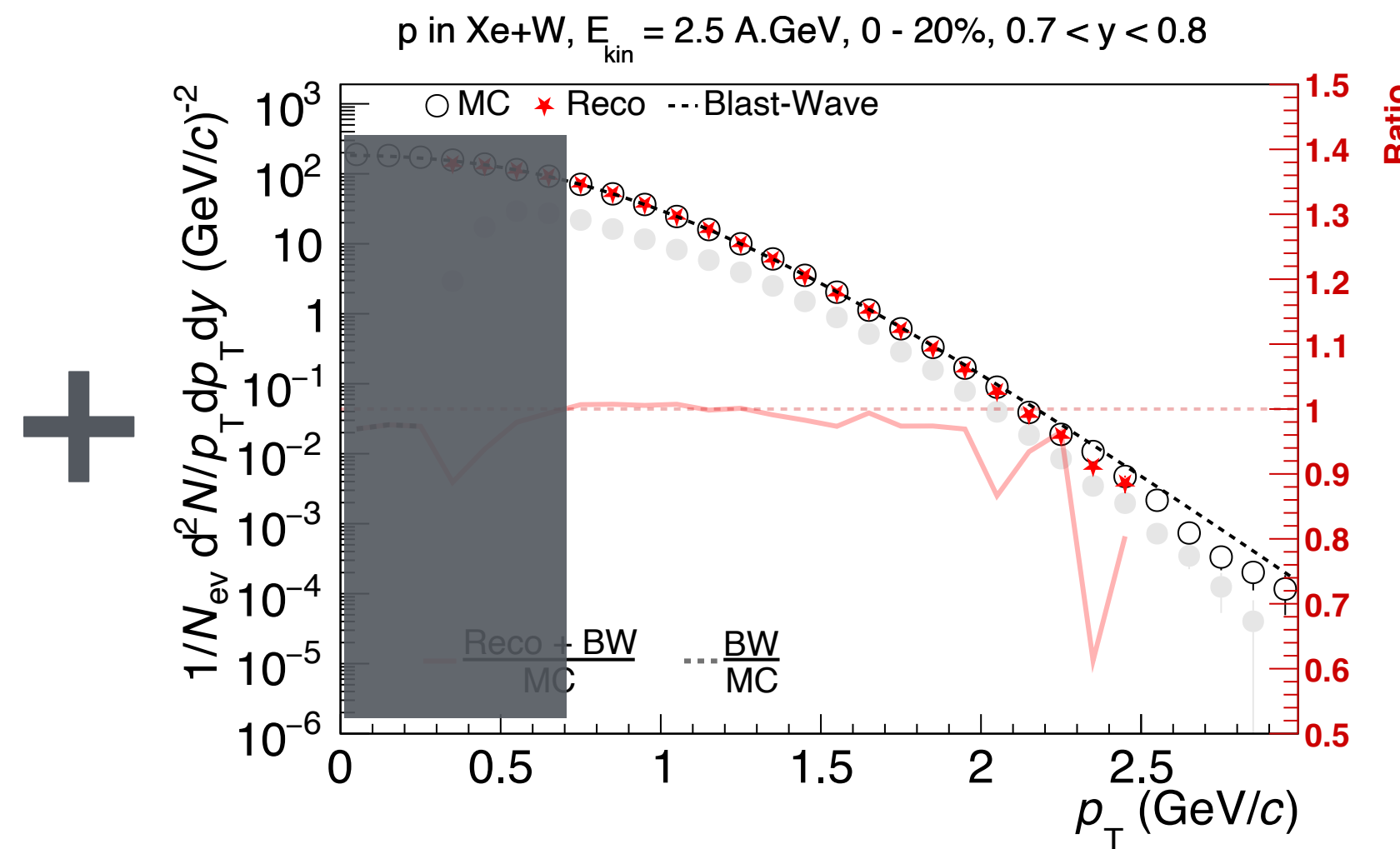
- The idea is to merge TPC-TOF and TOF-TPC spectra

Plots for MpdPid class!

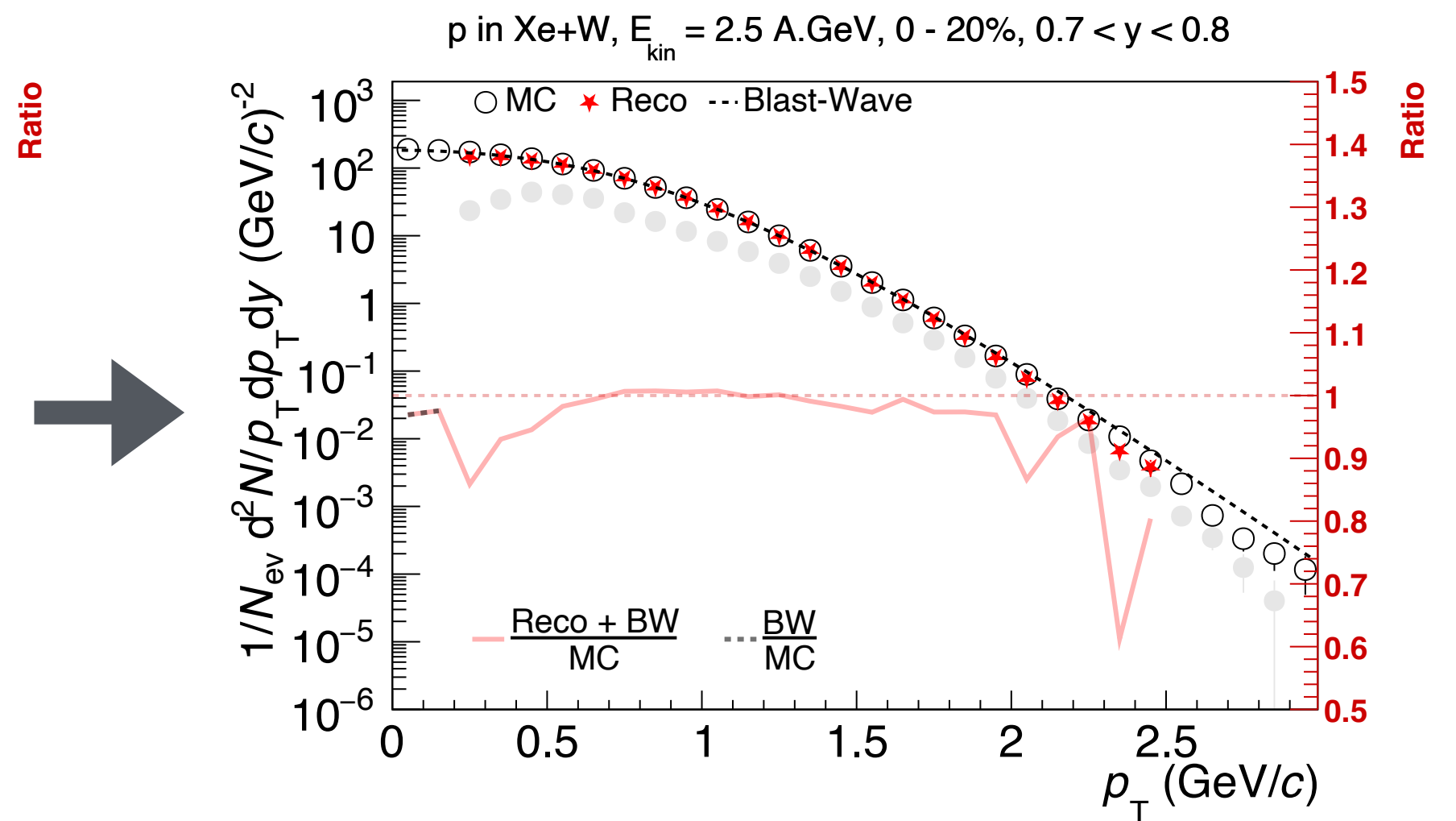
TPC-TOF



TOF-TPC



Merged

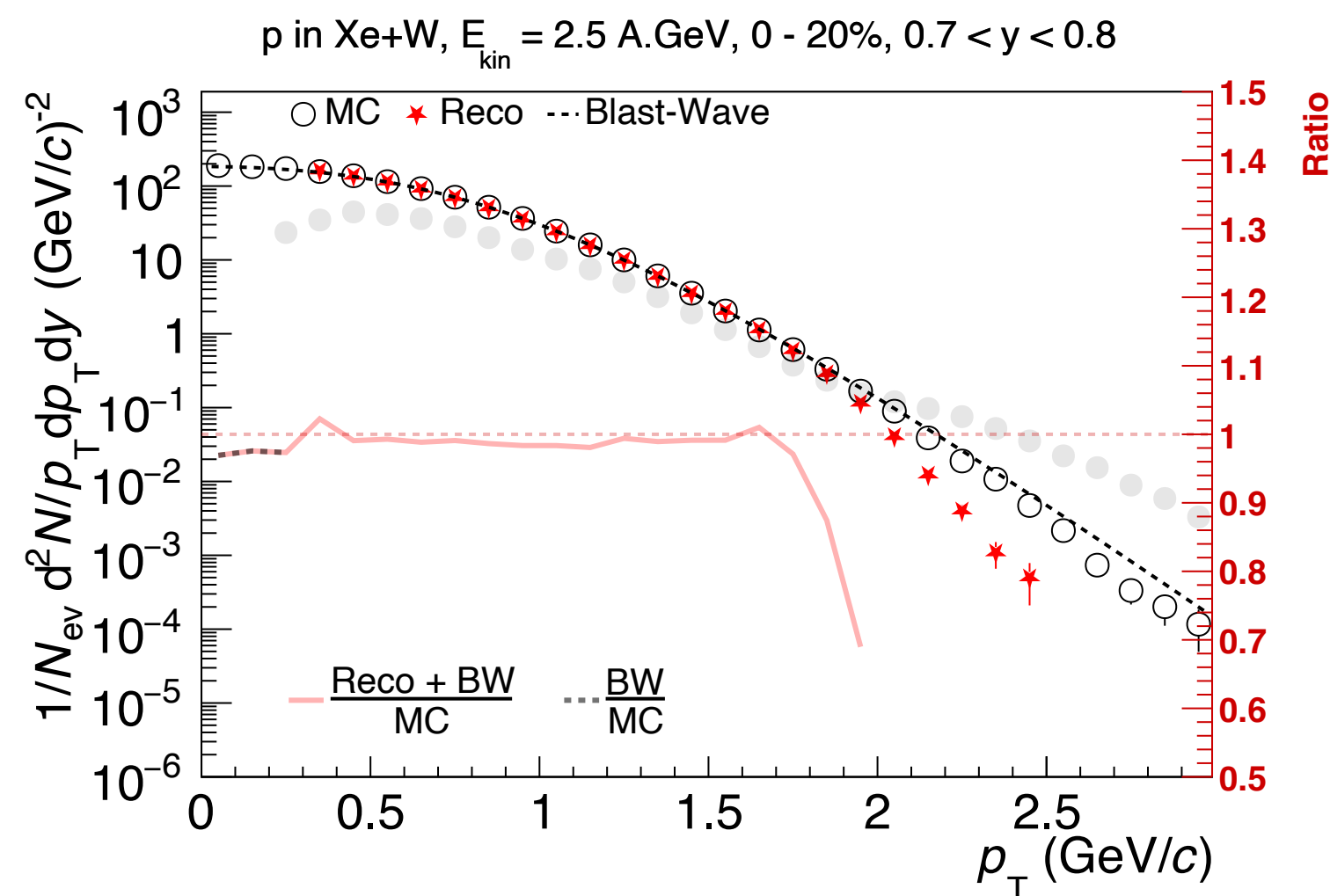


dE/dx + Combined PID: merging

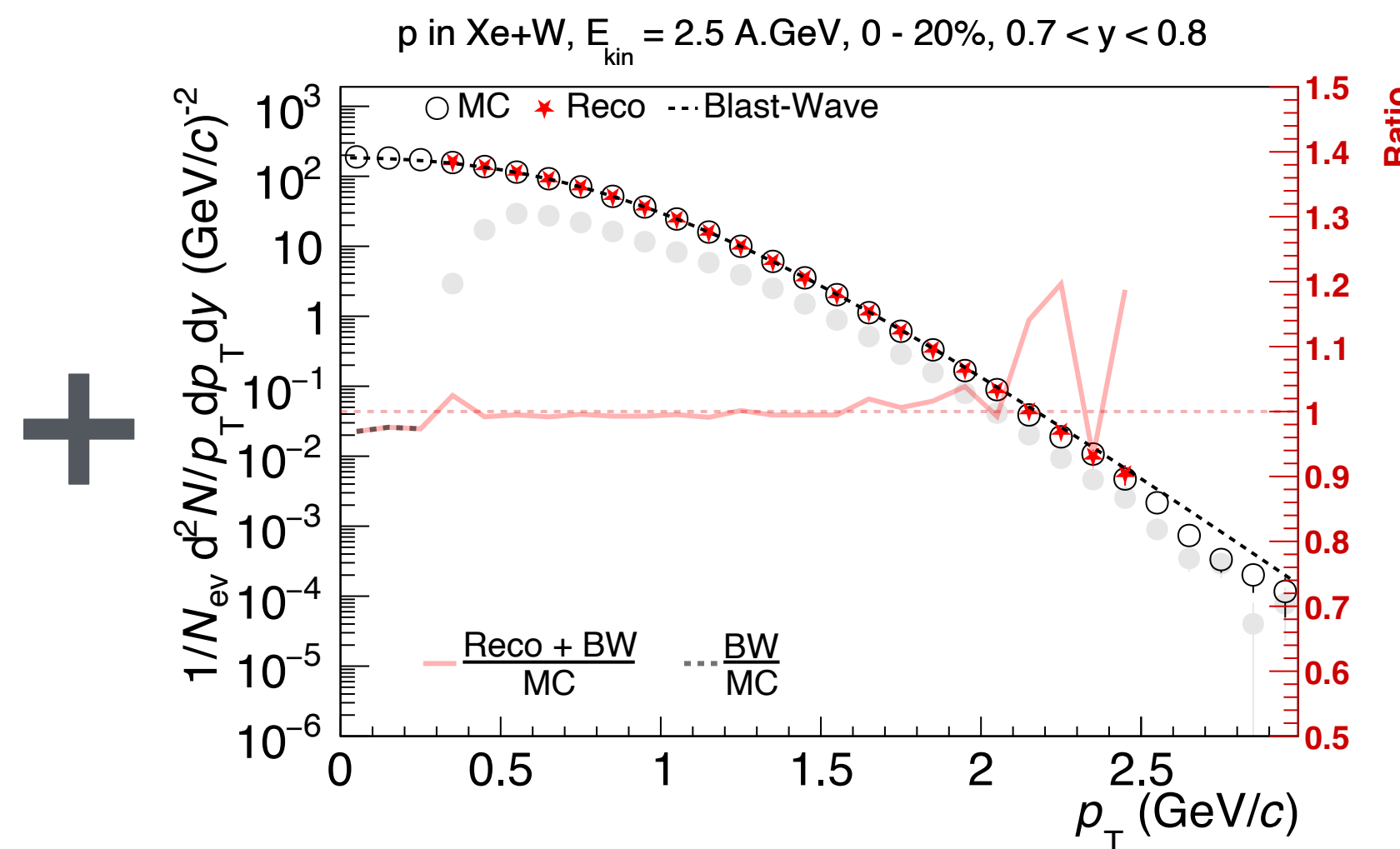
- Same idea for «dE/dx only» and «Combined PID» spectra

Plots for MpdPid class!

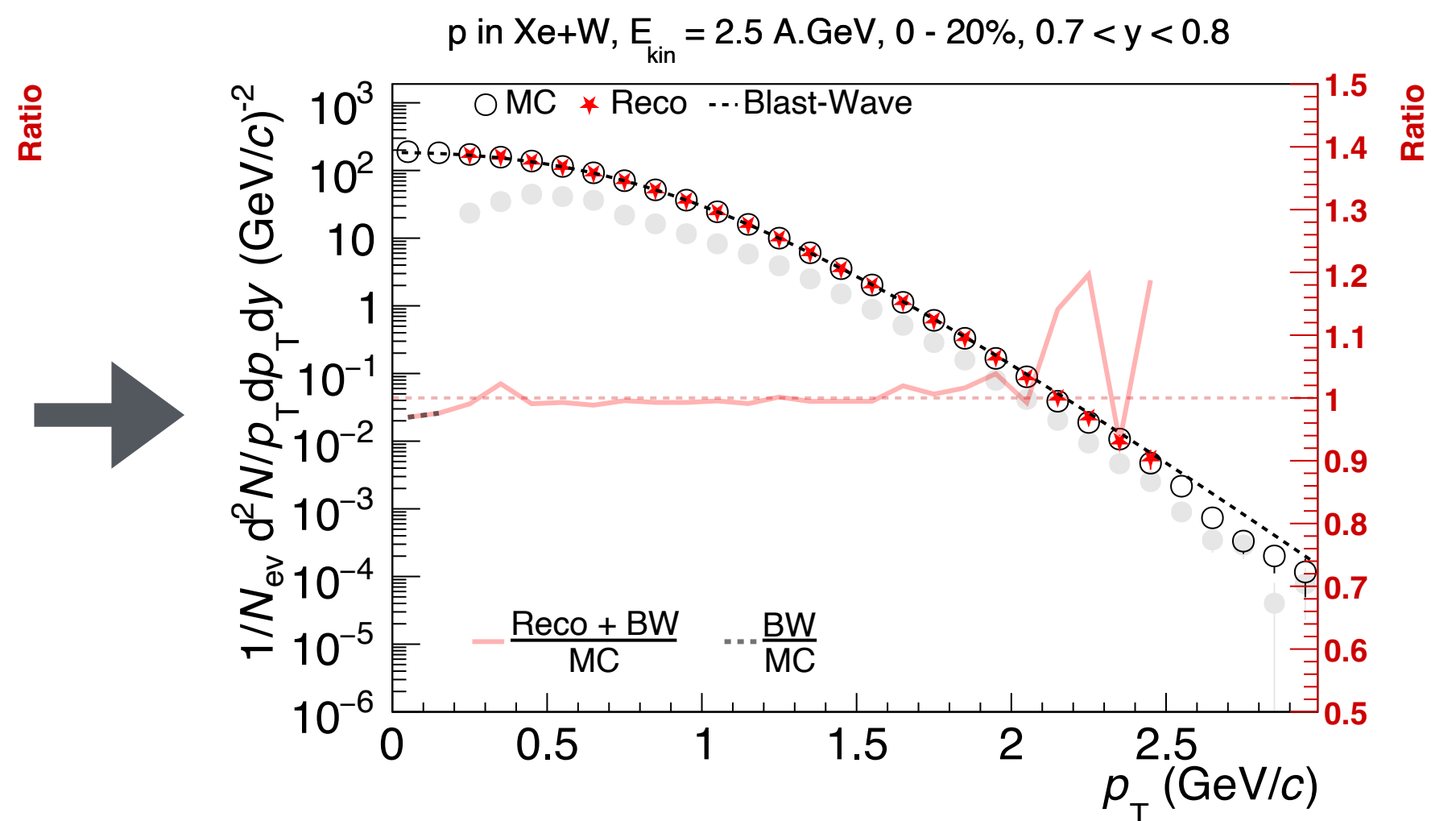
dE/dx



Combined



Merged

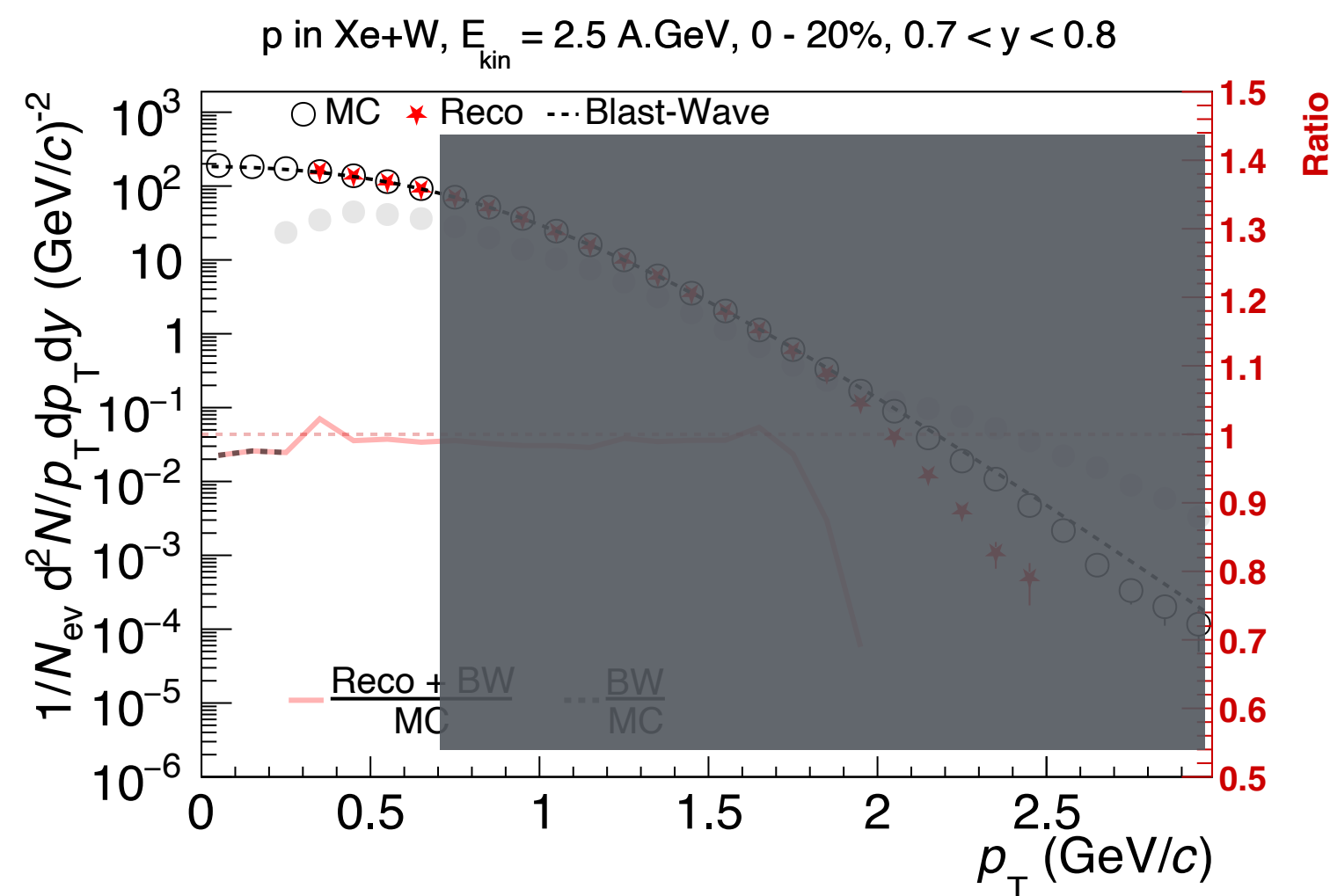


dE/dx + Combined PID: merging

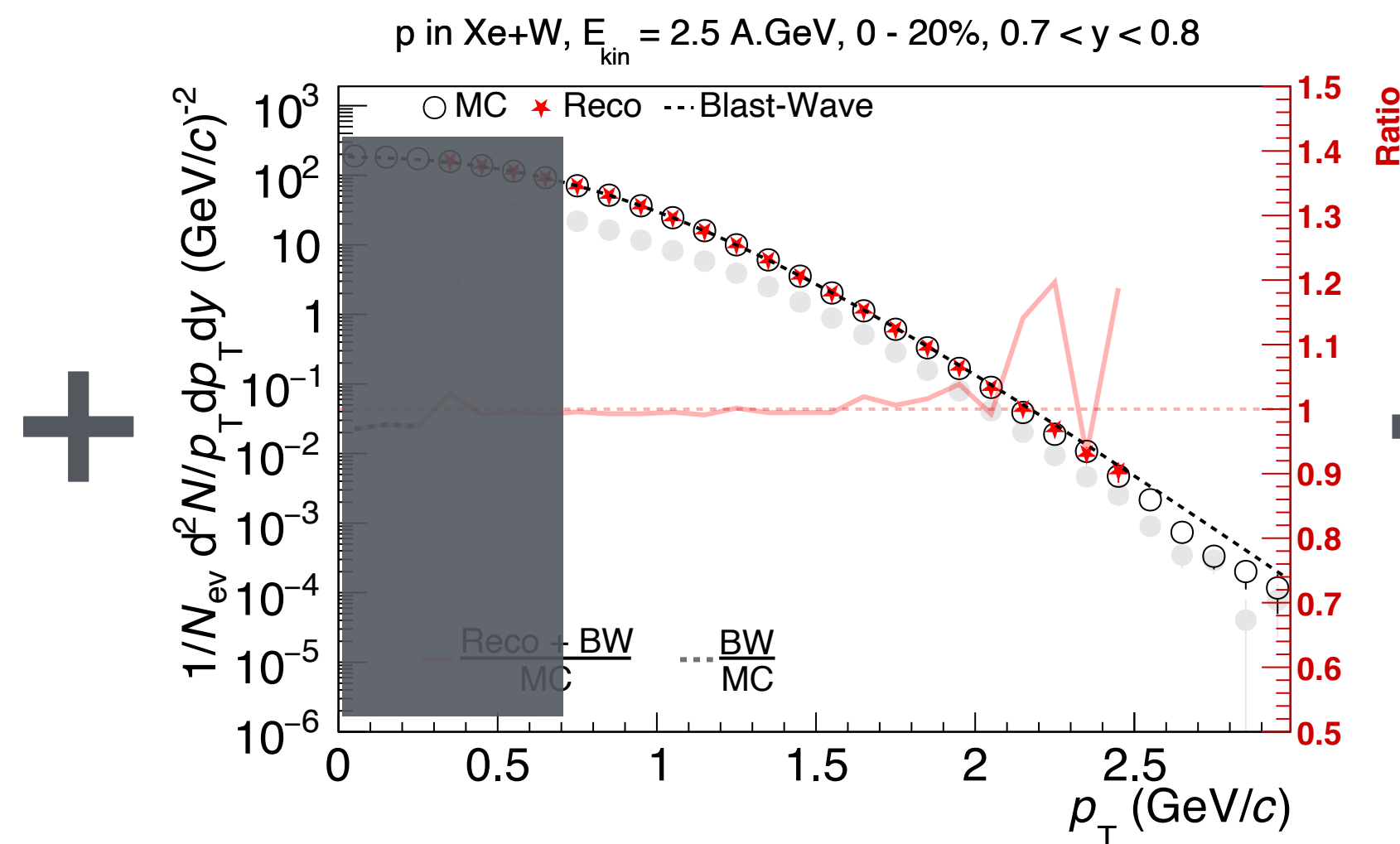
- Same idea for «dE/dx only» and «Combined PID» spectra

Plots for MpdPid class!

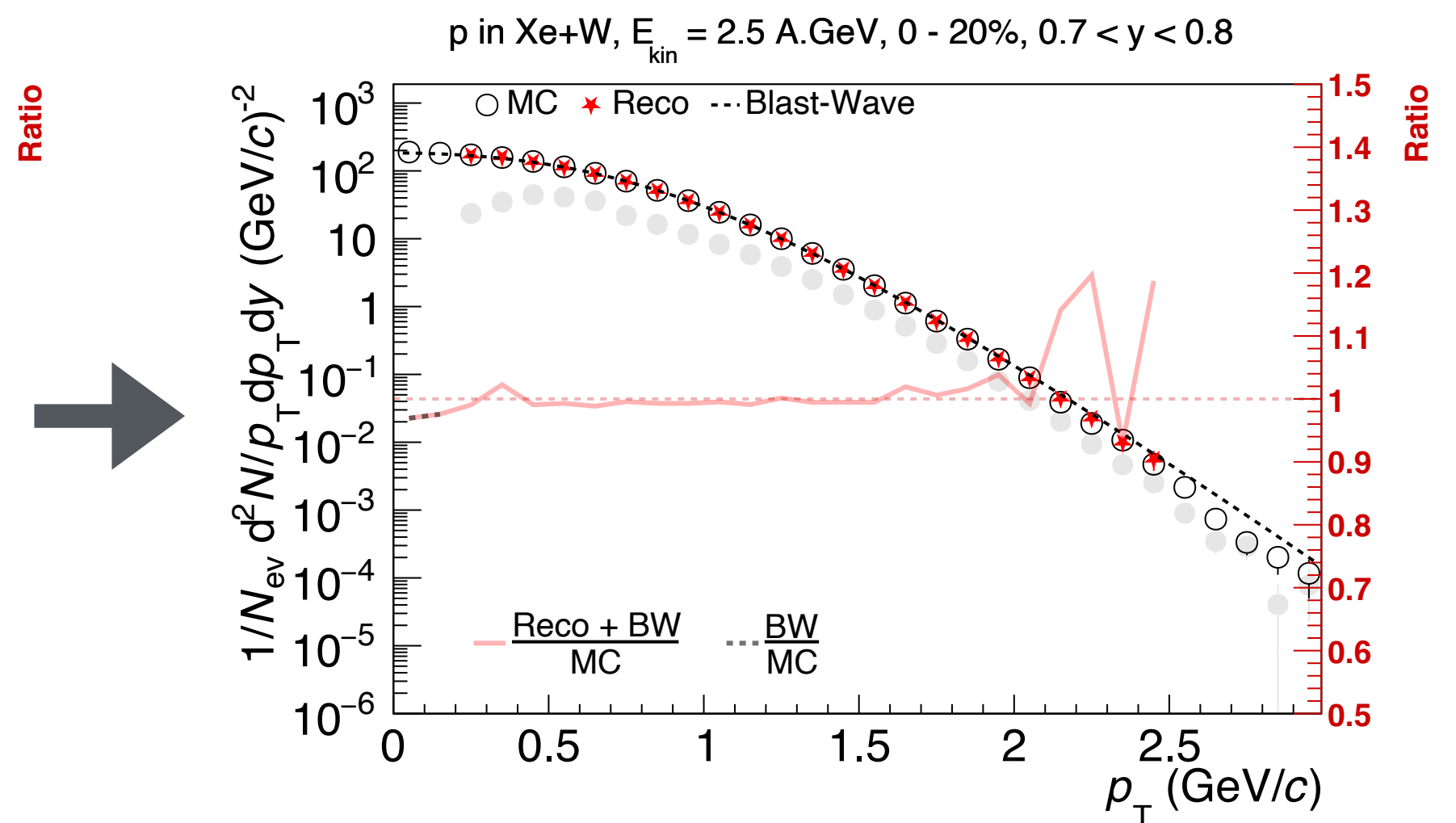
dE/dx



Combined

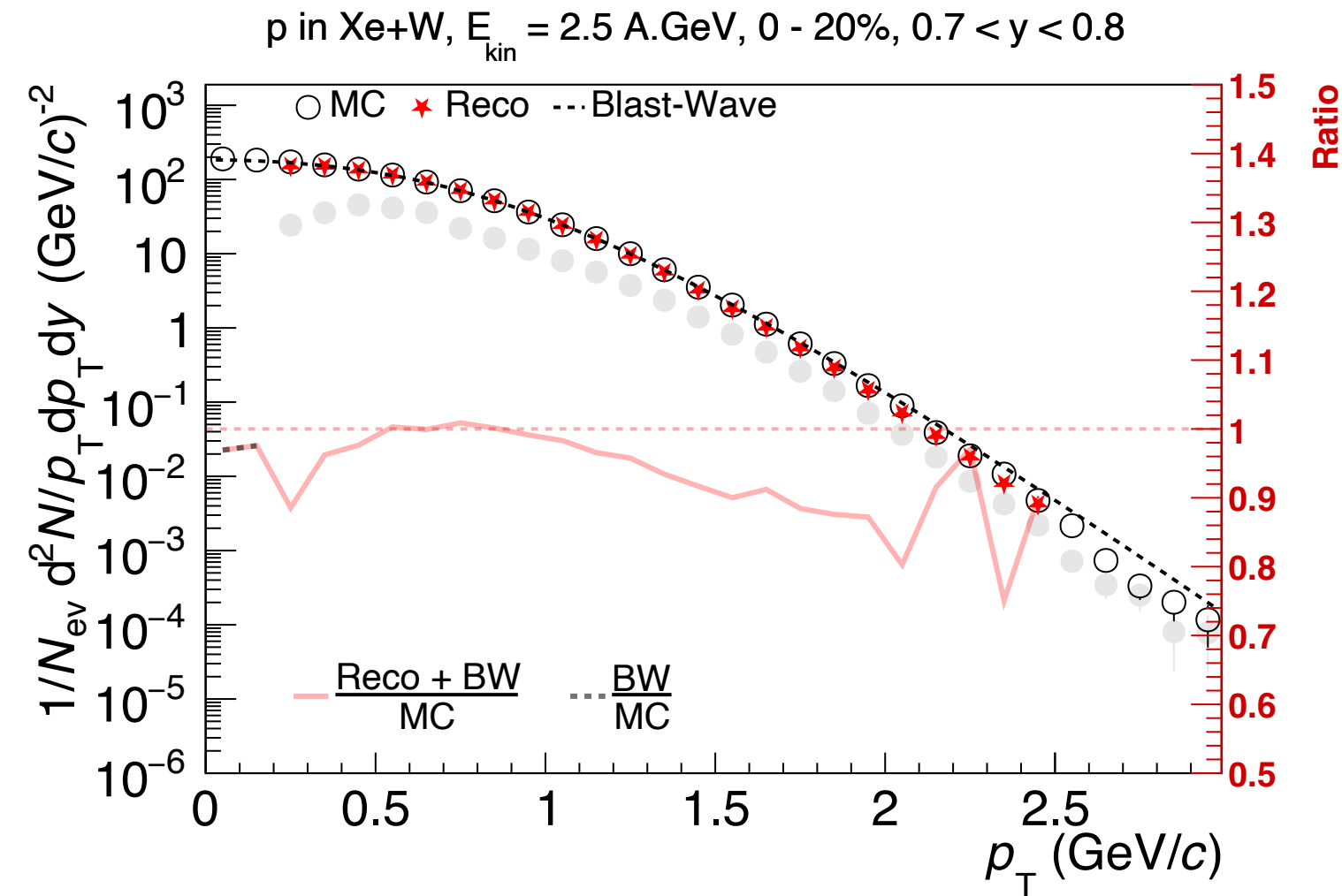


Merged

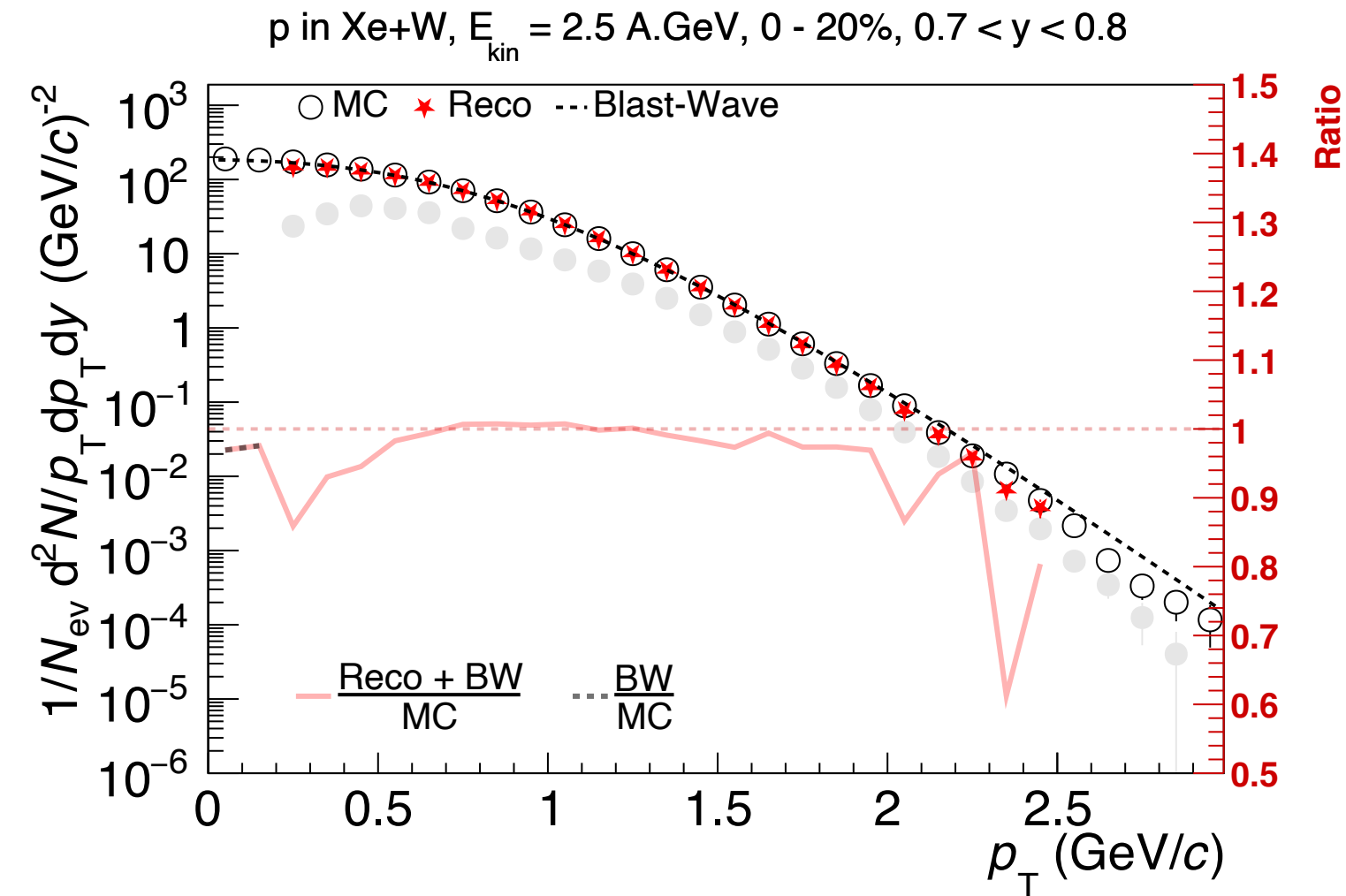


«Merged» spectra for all PID: protons

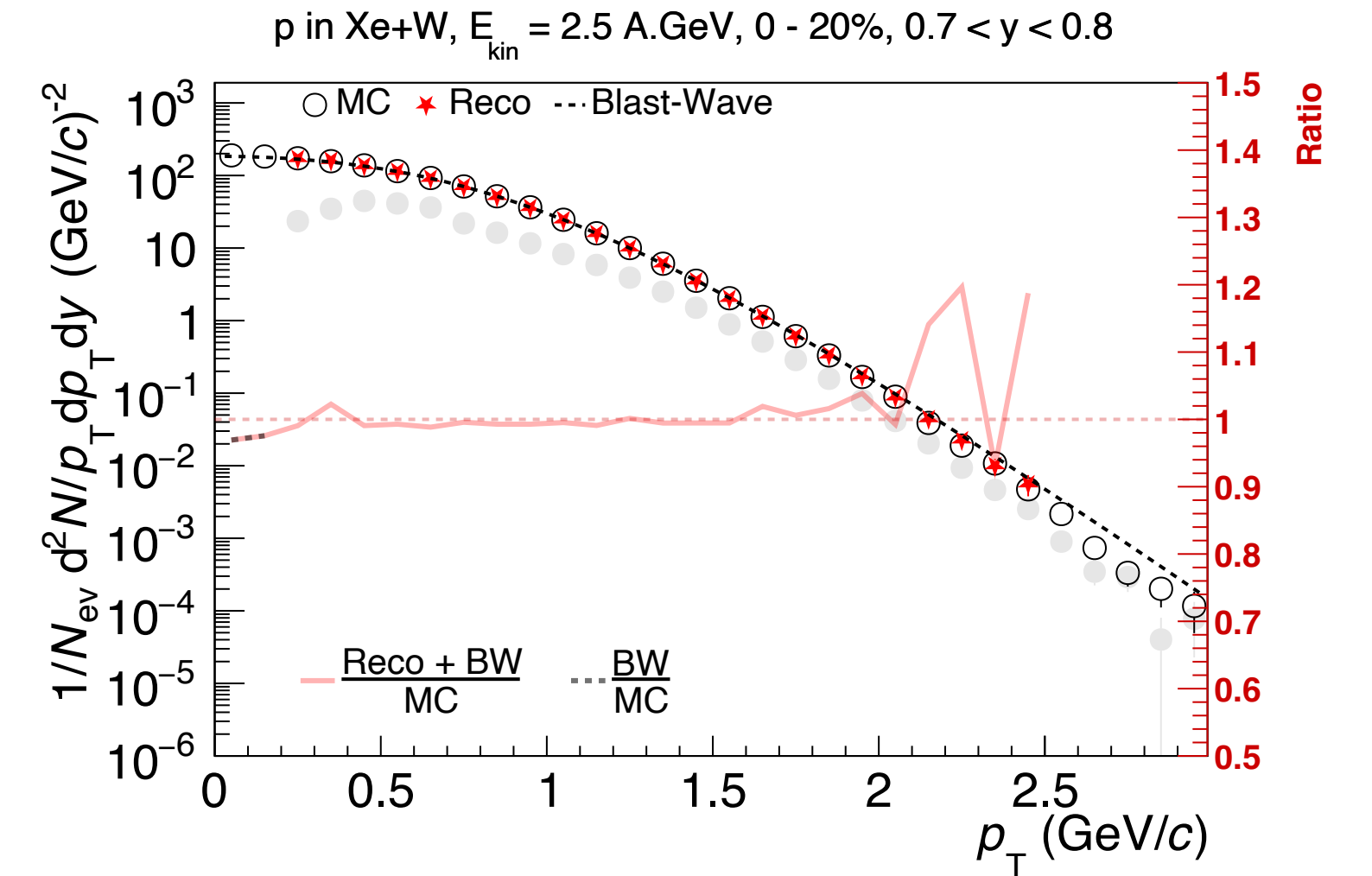
evPID: Veto



MpdPid: Veto

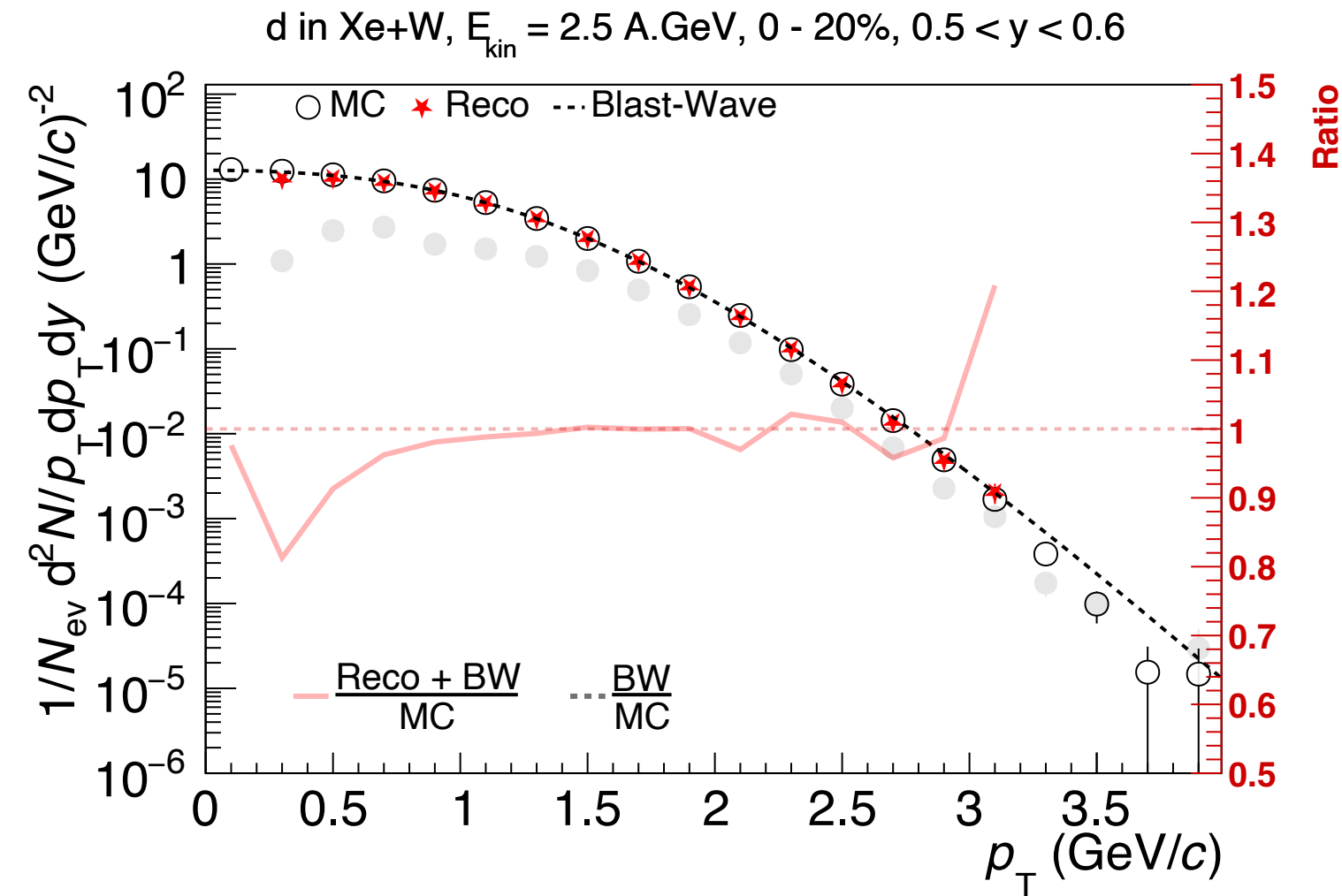


MpdPid: MaxProb

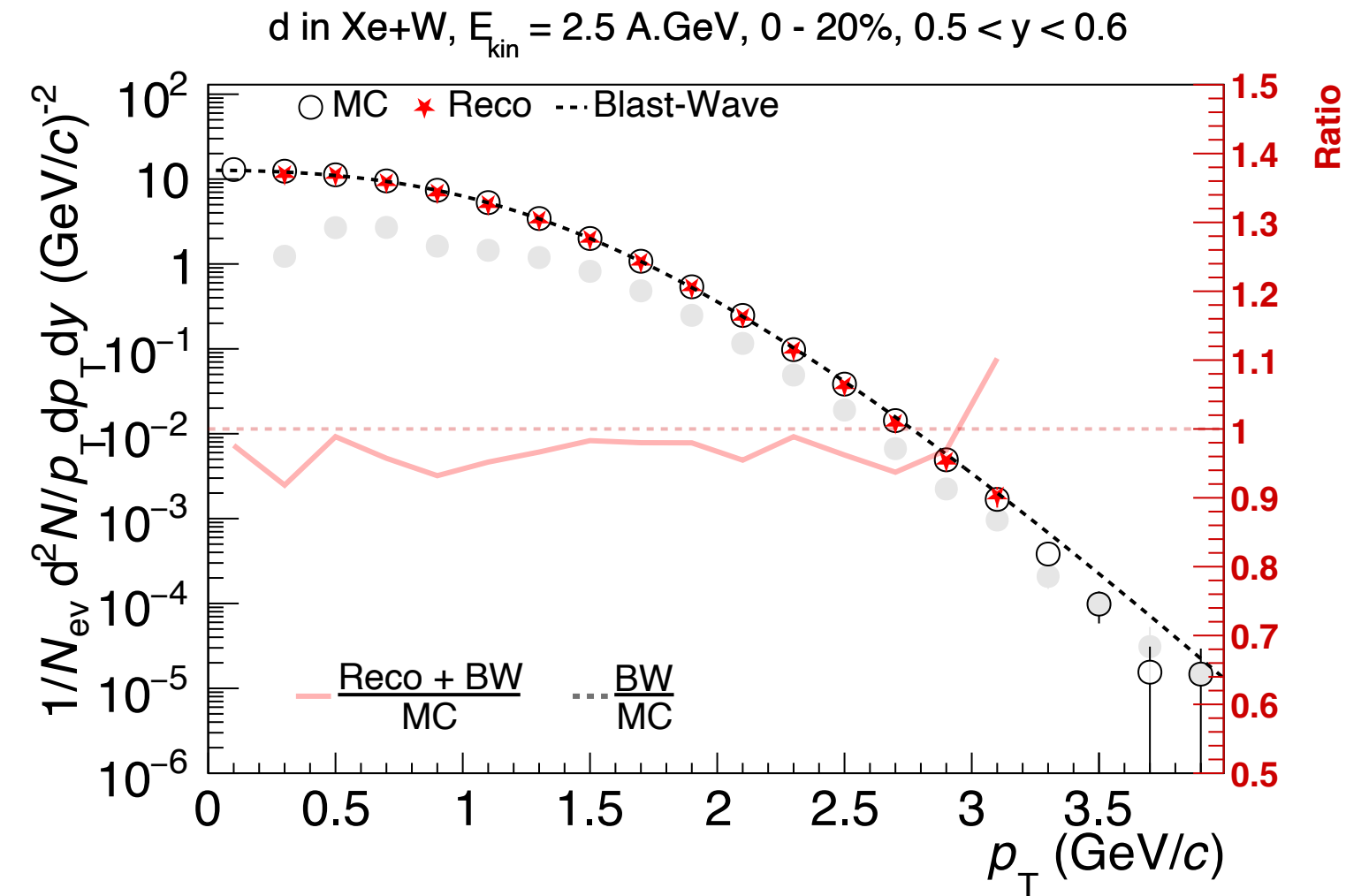


«Merged» spectra for all PID: deuterons

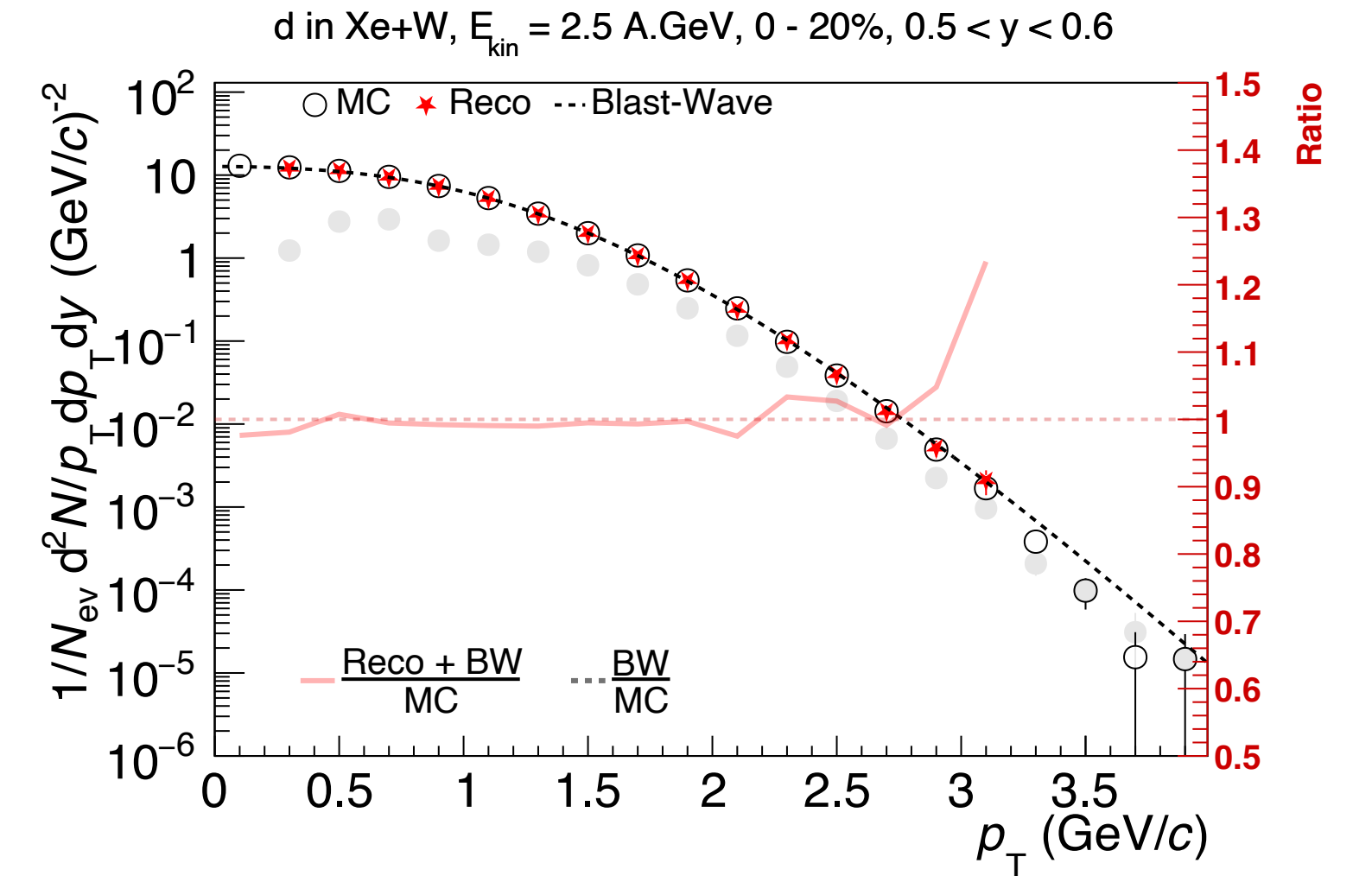
evPID: Veto



MpdPid: Veto



MpdPid: MaxProb



Summary

- «Nuclei» wagon can use any kind of the PID.
- For the «TPC-TOF» mode of the «Veto» PID additional ToF veto-cut in the case of the ToF-matching must be applied.
- No clear evidence on which PID type is «better».
- No clear evidence on the spectra «merging» benefits.
- Any PID type and mode gives very similar results.