MANTRA - BES III

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Outline

Quick recap

- We resolved the previously discussed hiccups.
- Now We are able to work with 7.0.8
- Compare real data with MC simulation.
- Shower shape, recoil momenta, seed energy, lat momenta, second momenta Vs $\Delta t_{\bar{n}}$ for real and MC data.

$J/\psi \to p\bar{n}\pi^-$ MC simulation

Name of the selection cut	cut Range
Rvxy	$\geq$1.0
Rvz0	$\leq$10.0
cosθ_{mdctrack}	$\geq$0.93
Good charge tracks MdcKalTrack Probability pion and proton selected	= 2
net charge	= 0
cosθ emc track energy emc track	$\leq$0.80 $\geq$ 0.05 *GeV*
cosθ emc track energy emc track	[0.86 , 0.92] $\geq$ 0.05 *GeV*
time window	0-14 ns
number of showers	1-9

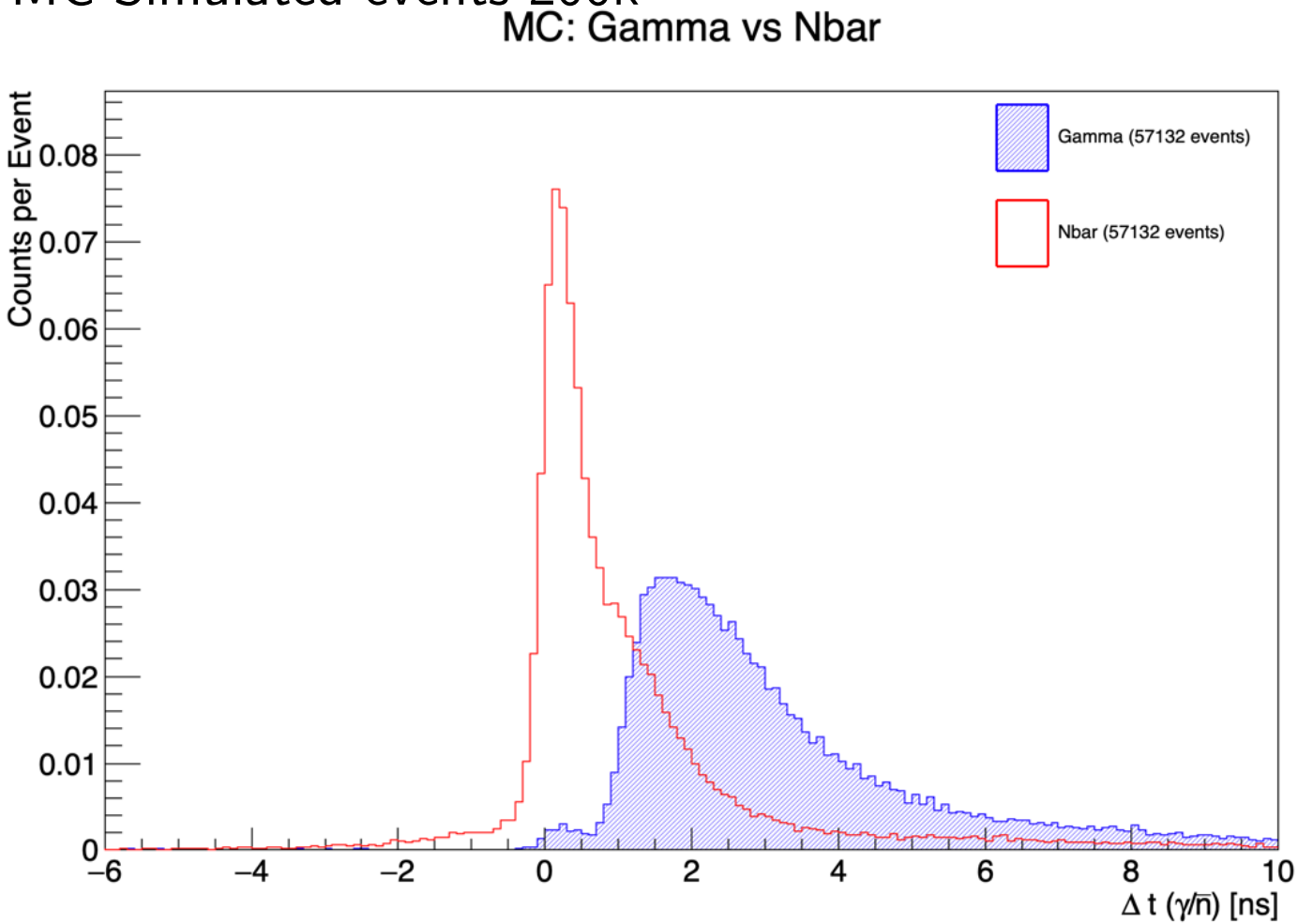
Δt distribution

- $\Delta t_n = t_{TOF} - t_{exp(n)}$
- $\Delta t_\gamma = t_{TOF} - t_{exp(\gamma)}$
  - $t_{exp}=L/(\beta c)$, $\beta=p/\sqrt{p^2c^2+M^2c^4}$

- L is the path of flight by extrapolating the corresponding shower from EMC to TOF
- p is momentum of neutral track from recoiling charged tracks

$J/\psi \to p\bar{n}\pi^-$ MC simulation

Unife work: MC Simulated events 200k

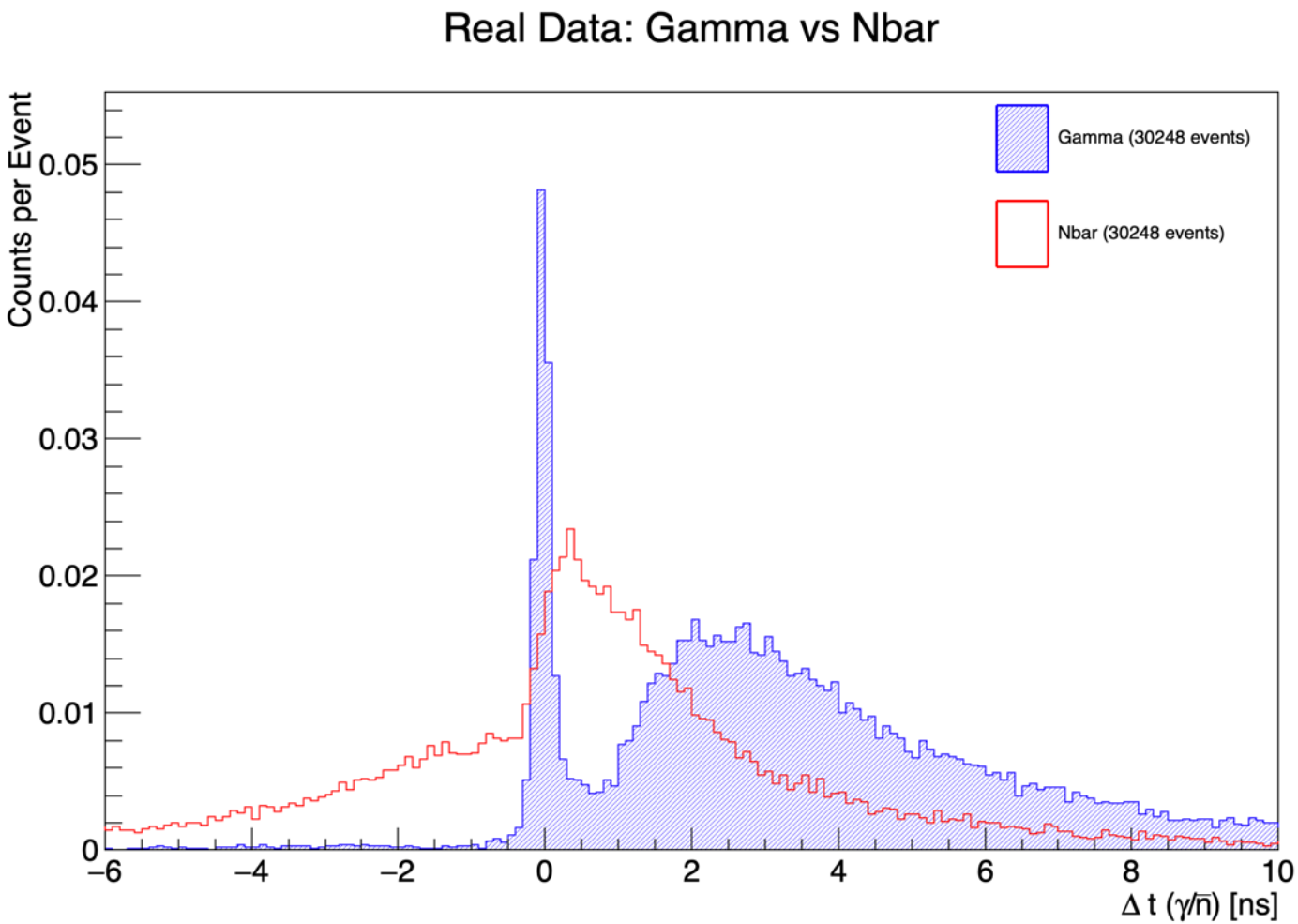


Ref: Dr.Pelian talk1: TOF neutral reconstruction

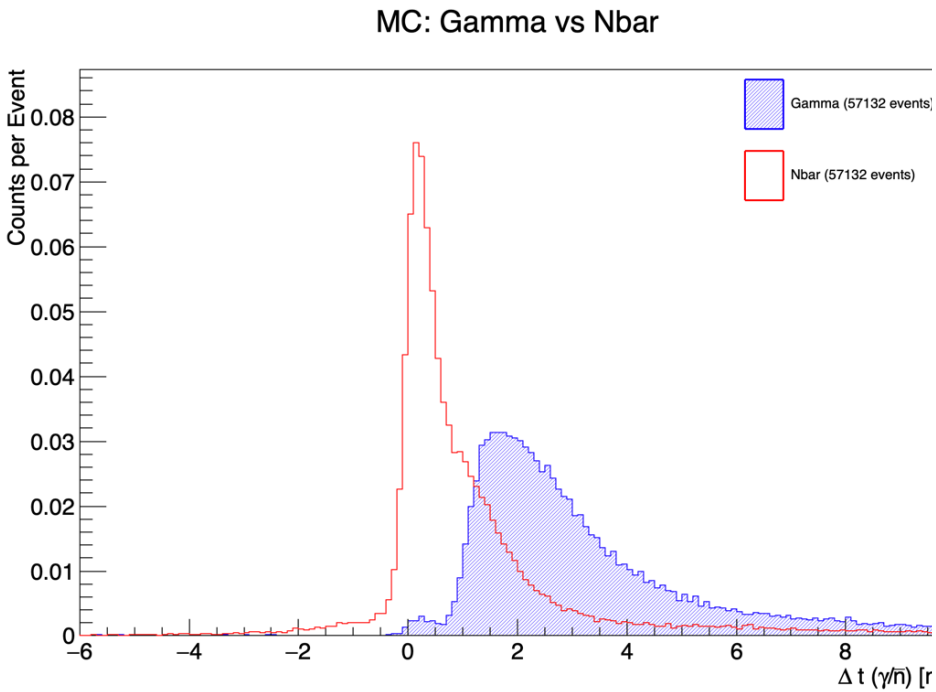
Ref: Dr.Pelian talk2: TOF neutral reconstruction

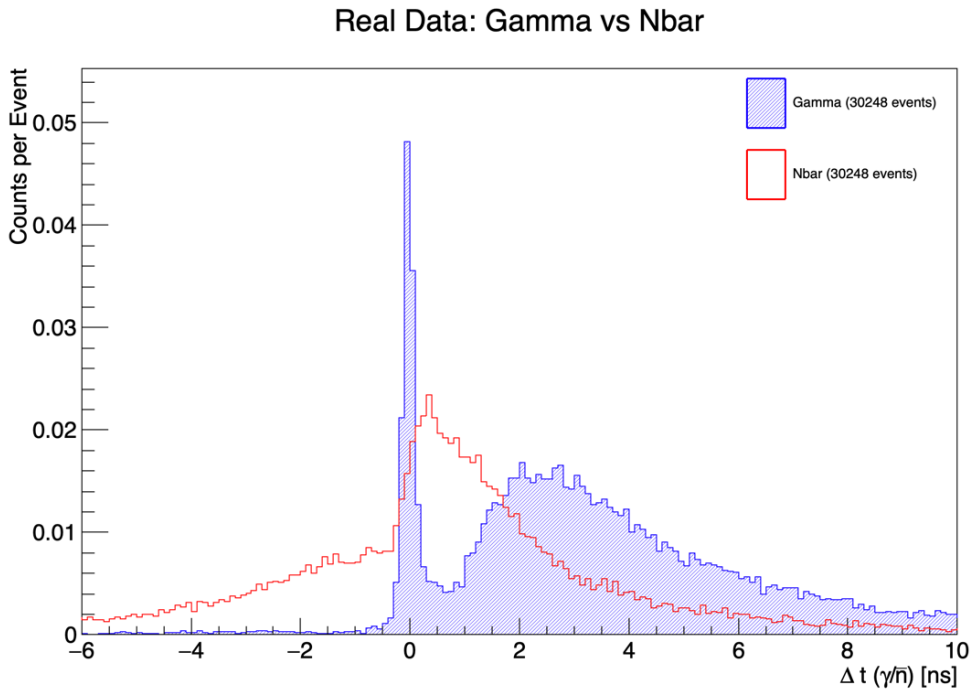
$J/\psi \to p\bar{n}\pi^-$ Real data

Unife work:/bes3fs/offline/data/708-1/jpsi/round05/dst/120410 to 120420, & tag files are used

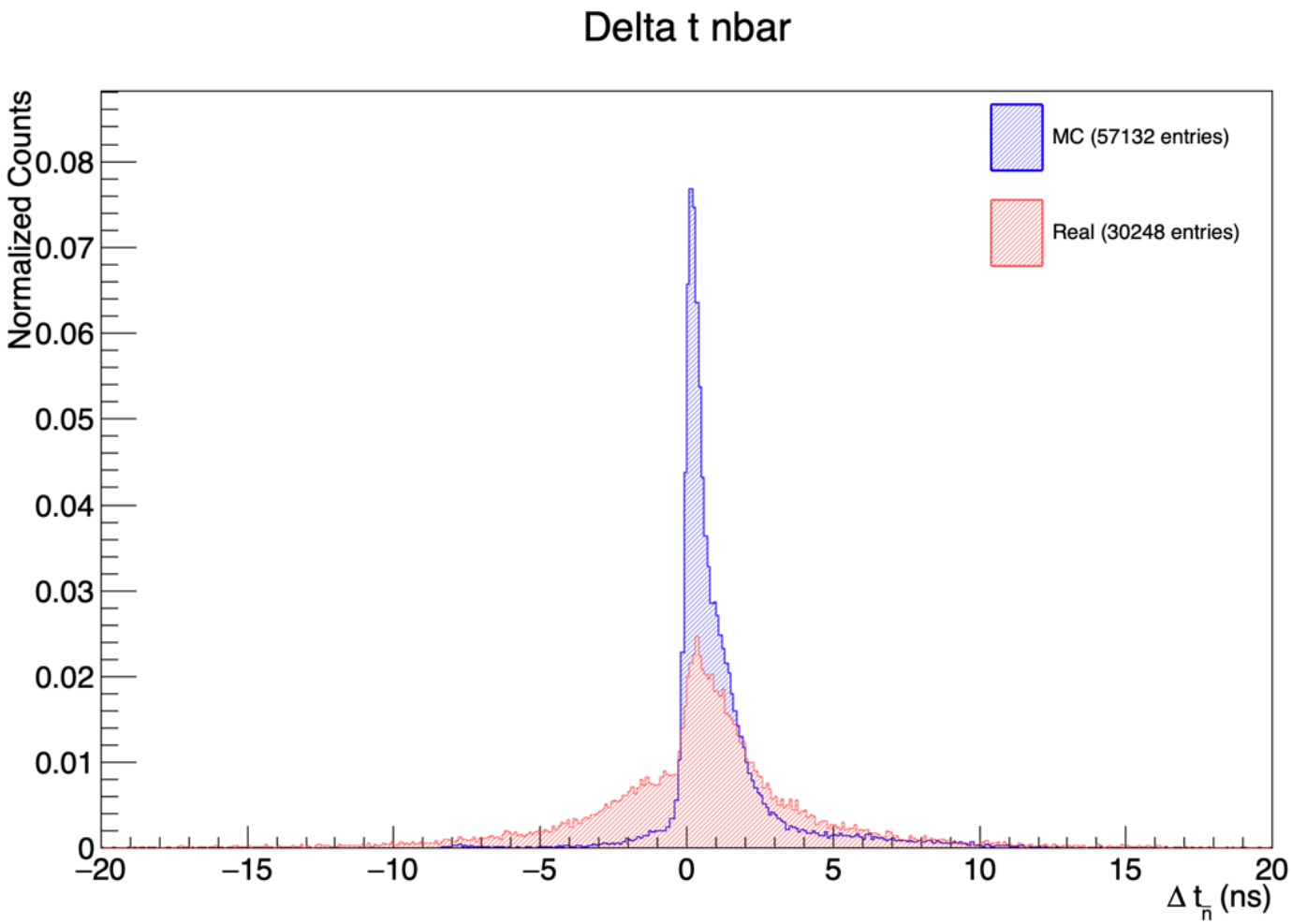


$J/\psi \to p\bar{n}\pi^-$ MC & Real comparison between γ*vs*

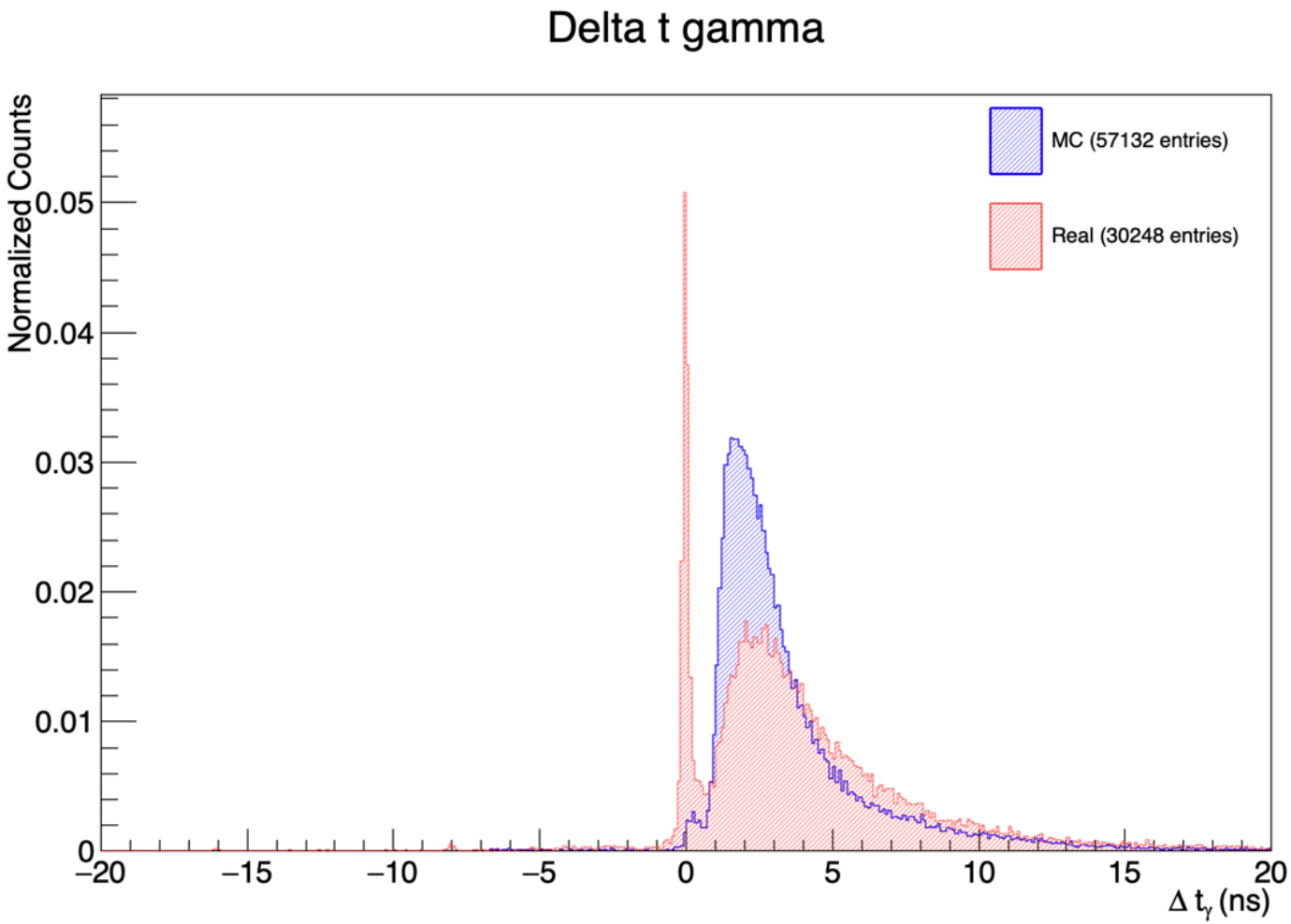




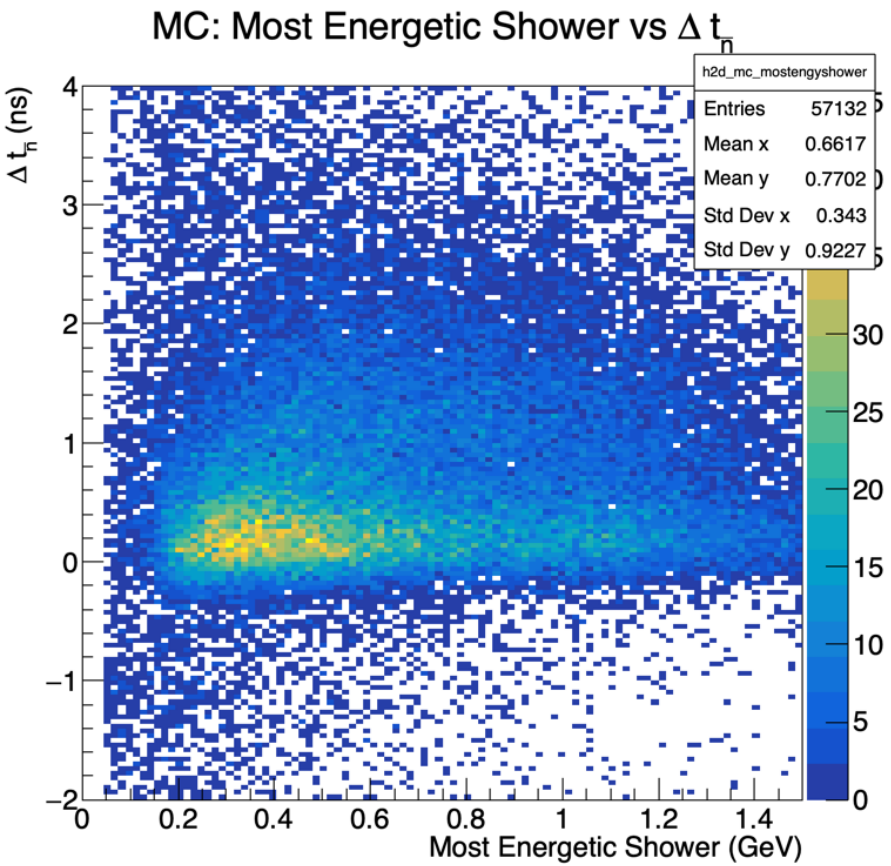
$J/\psi \to p\bar{n}\pi^-$ MC & Real comparison for $\bar{n}$

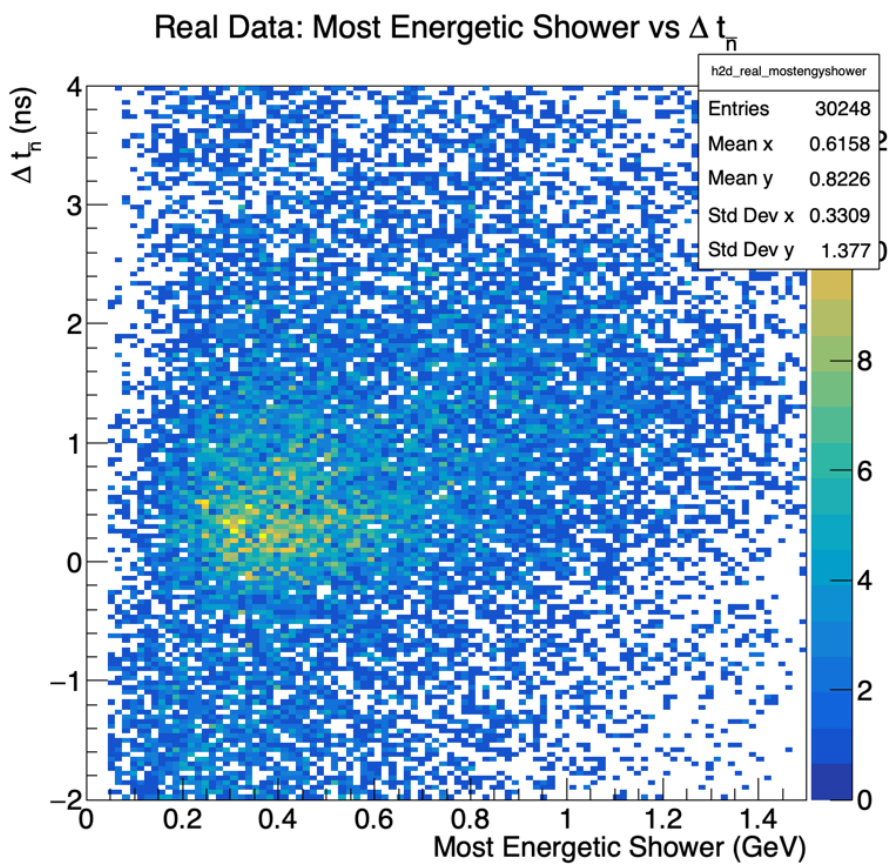


$J/\psi \to p\bar{n}\pi^-$ MC & Real comparison for γ

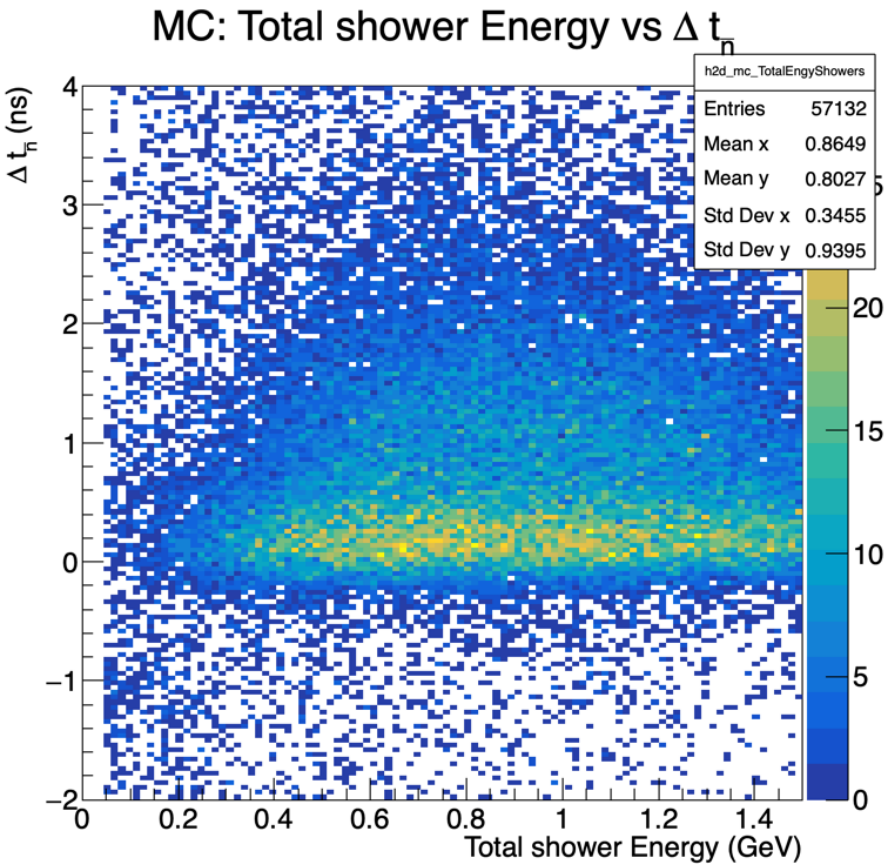


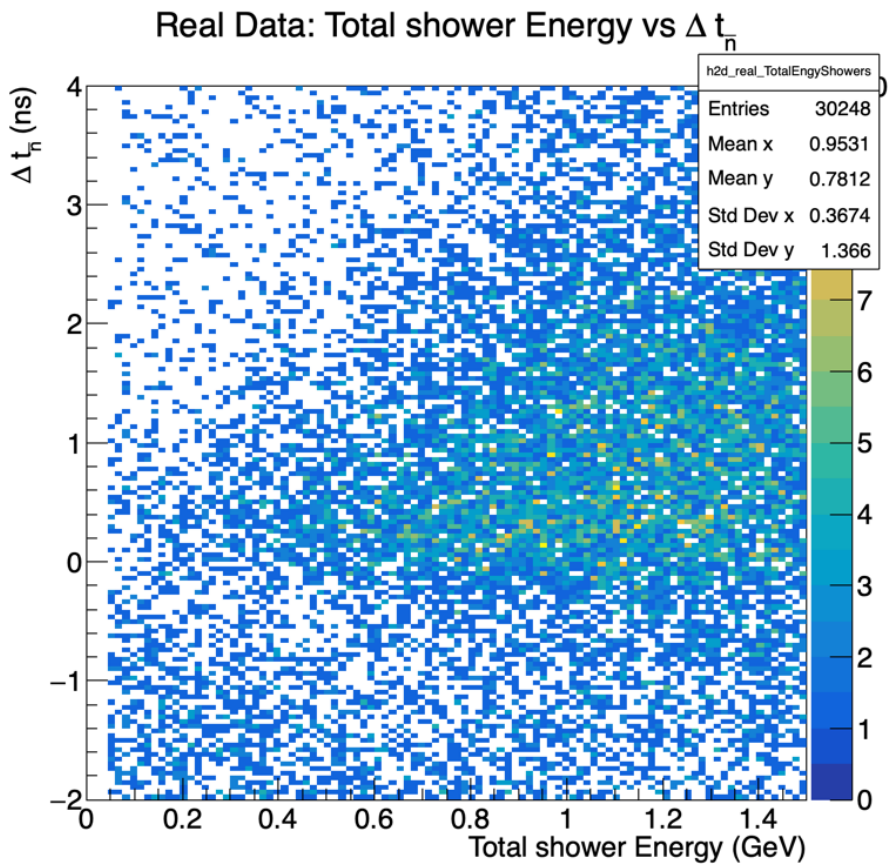
$J/\psi \to p\bar{n}\pi^-$ MC & Real comparison for $\Delta t_{\bar{n}}$ vs most energetic shower



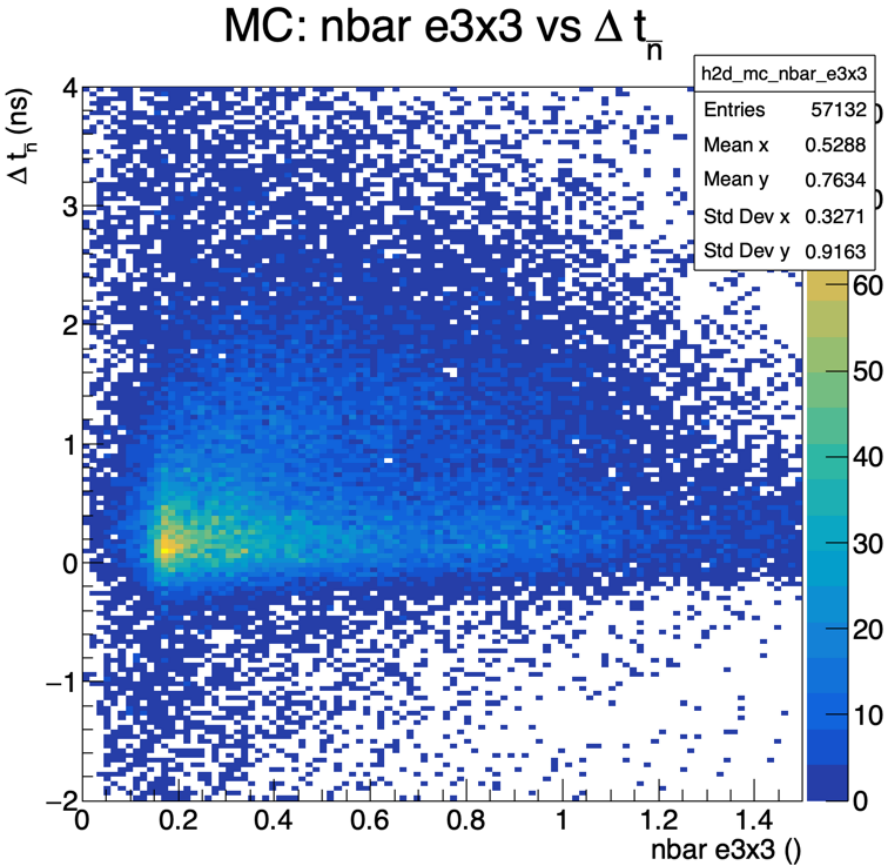


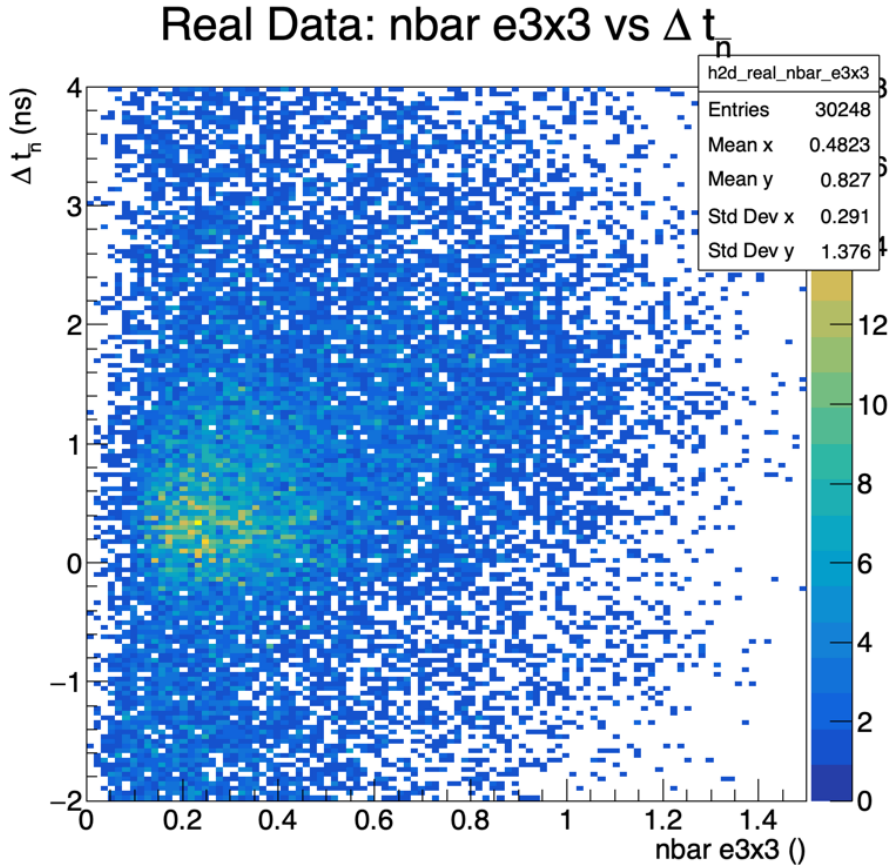
$J/\psi \to p\bar{n}\pi^-$ MC & Real comparison for $\Delta t_{\bar{n}}$ vs total shower energy



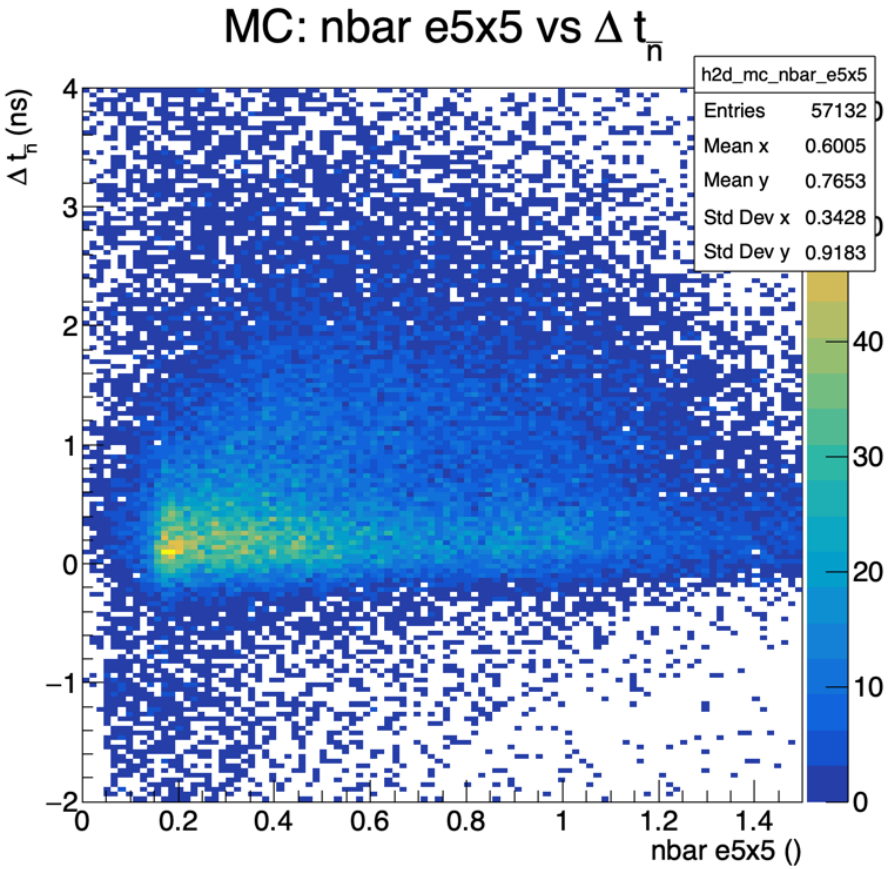


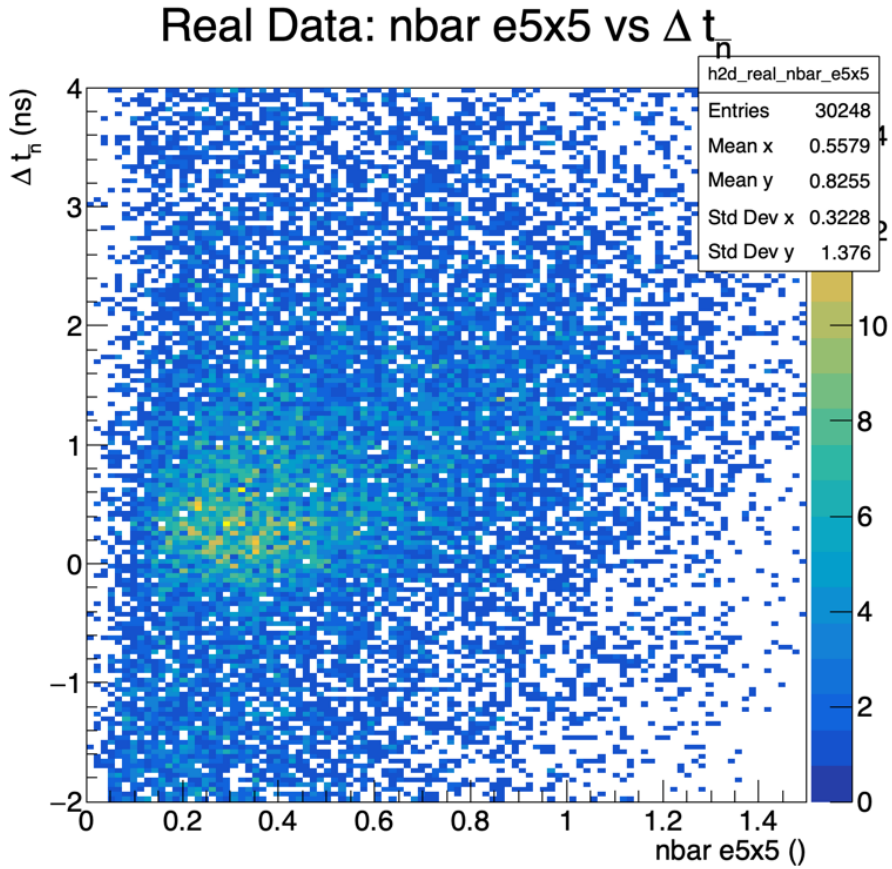
$J/\psi \to p\bar{n}\pi^-$ MC & Real comparison for $\Delta t_{\bar{n}}$ vs $\bar{n}_{e3x3}$



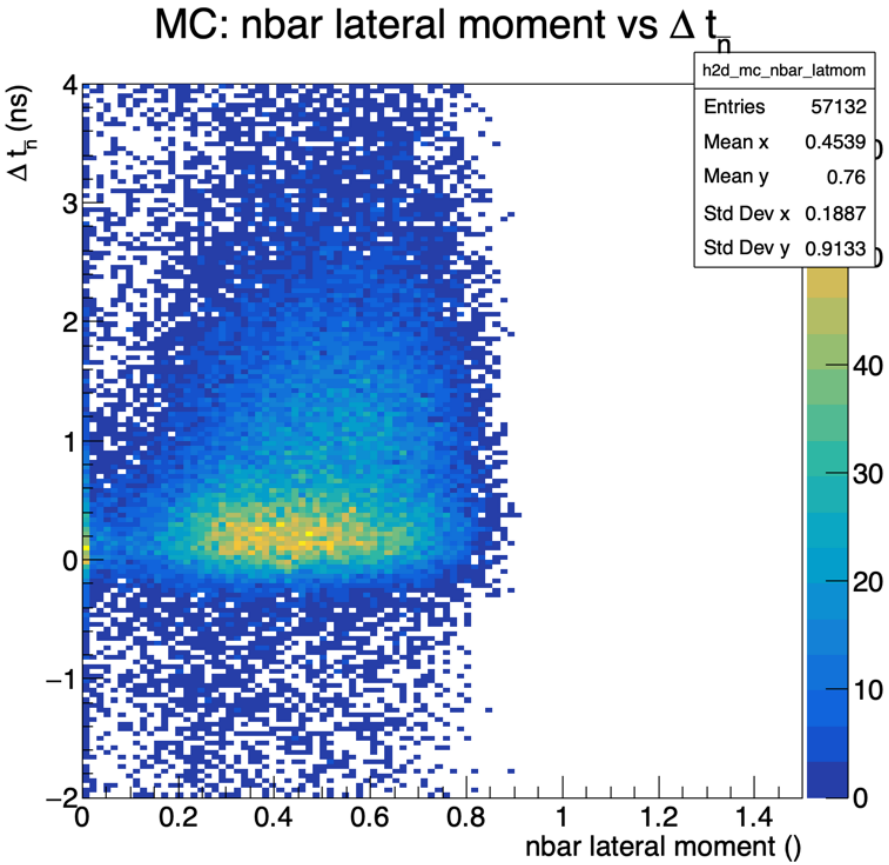


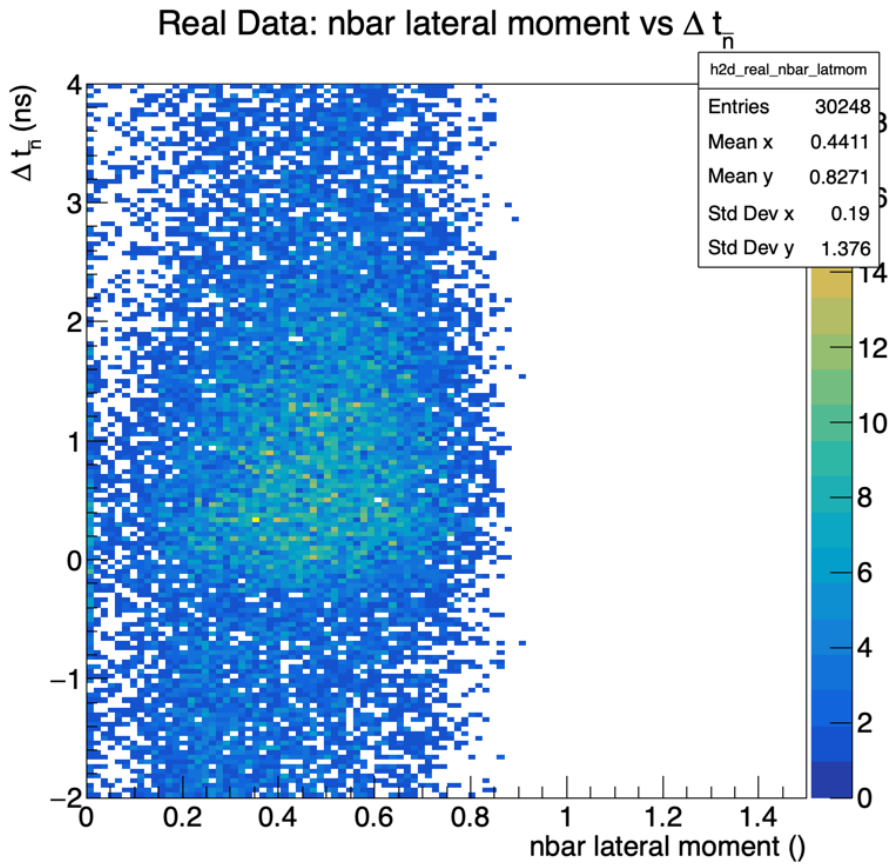
$J/\psi \to p\bar{n}\pi^-$ MC & Real comparison for $\Delta t_{\bar{n}}$ vs $\bar{n}_{e5x5}$





$J/\psi \to p\bar{n}\pi^-$ MC & Real comparison for $\Delta t_{\bar{n}}$ vs $\bar{n}_{latmom}$





Summary and Future work

- Future Work:
- Reason behind the peak in $\Delta t_{\bar{n}} \sim 1ns$
- Compare real data with MC simulation for more real data files.
- Shower shape, recoil momenta, seed energy, lat momenta, second momenta Vs $\Delta t_{\bar{n}}$ for real and MC data.
- work on the different cuts to make sure MC and real data matches
- Suggestions are welcome