MANTRA - BES III

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Outline

1. Meeting with Dr. Pelian
2. $J/\psi \to p\bar{n}\pi^-$ MC simulation
3. Future work

Meeting with Dr. Pelian

- We met Dr. LiPelian regarding Neutral particleTOF
- We had to go back to older BES version 6.5.5p01 not 7.0.8
- Simulated 20k events as testing this analysis code
- Compare MC with real 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	= 2
MdcKalTrack Probability pion and proton selected	
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

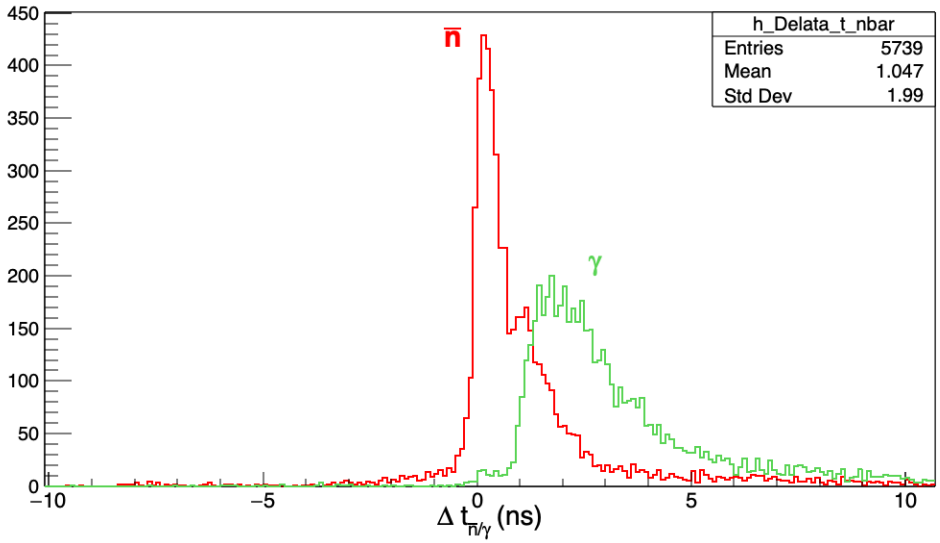
$J/\psi \to p\bar{n}\pi^-$ MC simulation (cont)

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

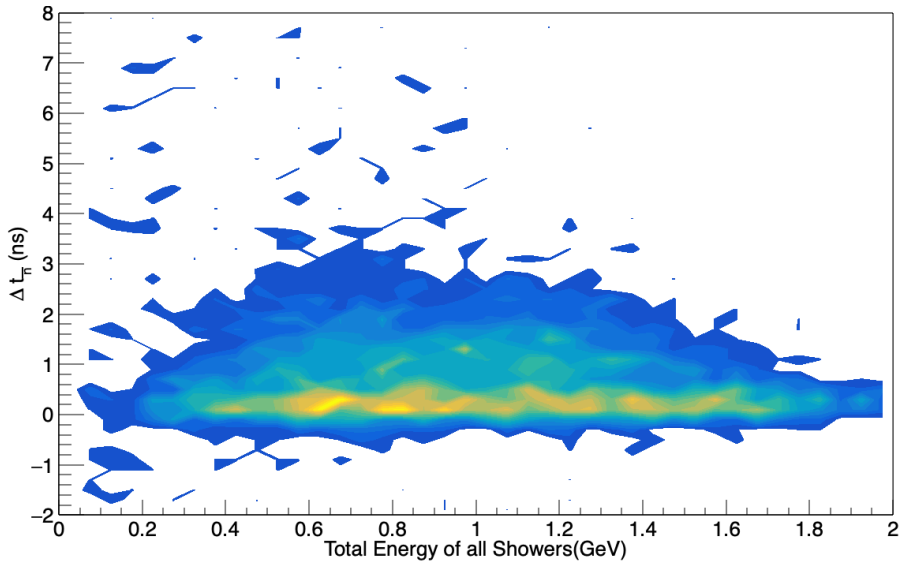


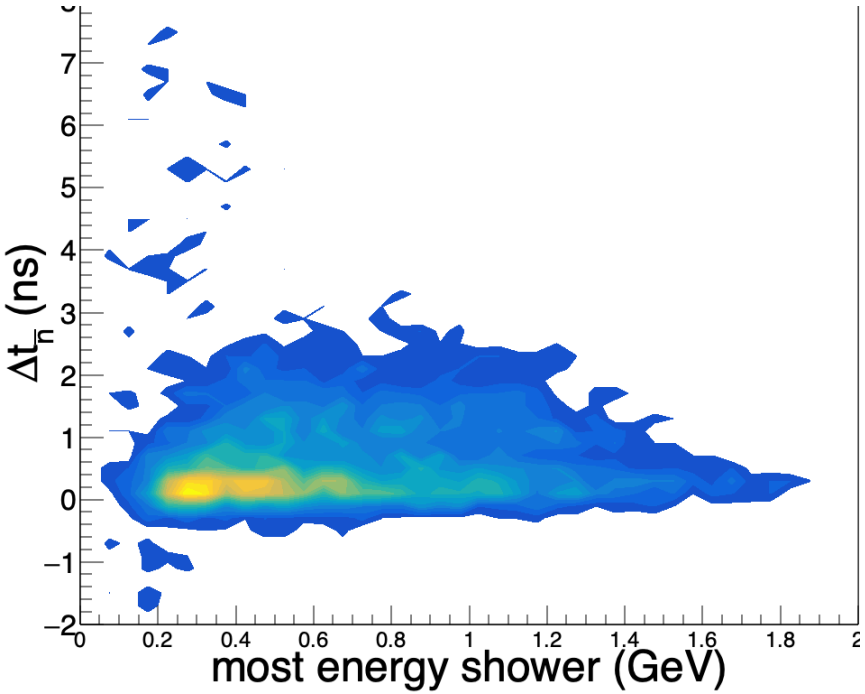
Dr.Pelian talk1: TOF neutral reconstruction

Dr.Pelian talk2: TOF neutral reconstruction

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

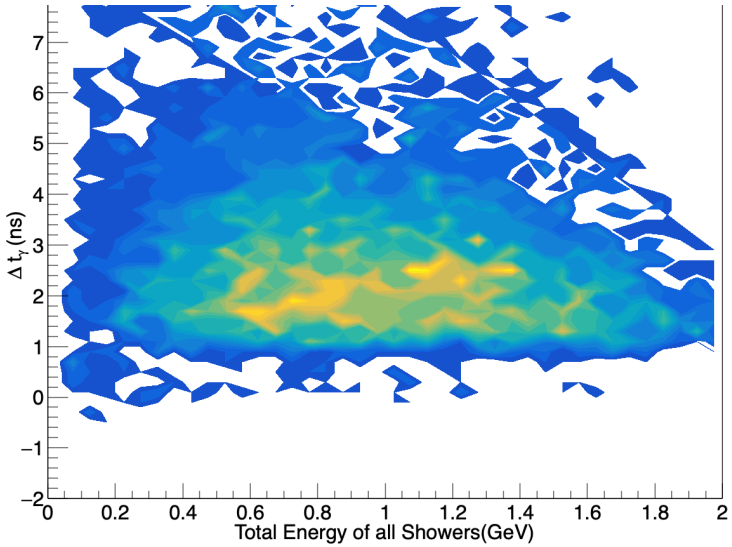
Shower energy Vs $\Delta t_{\bar{n}}$

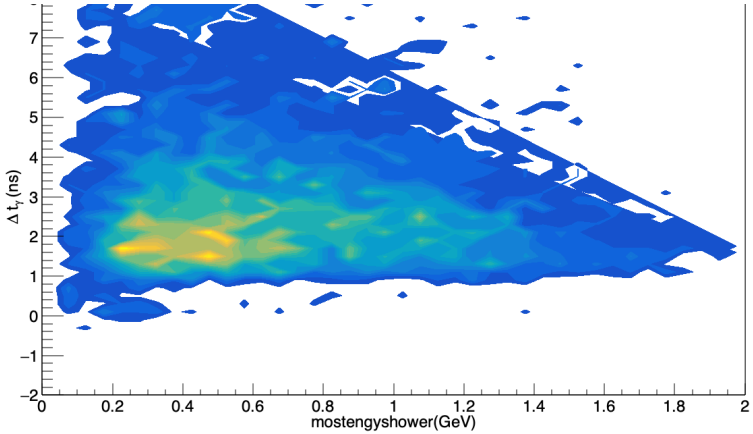




$J/\psi \to p\bar{n}\pi^-$ MC simulation (cont)

Shower energy Vs Δt_γ





Summary and Future work

- Summary:
- Updating the analysis notes regularly.
- Future Work:
- Reason behind the peak in $\Delta t_{\bar{n}} \sim 1ns$
- 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.