Electromagnetic-Jet A_N in FMS

Dataset run 17 p↑ + p collision at √s=510 GeV

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Run 17 Dataset

- Extract A_N as a function of EM-jet-p_T, energy, and photon multiplicity ($p\uparrow + p \rightarrow$ EM-jet + X)

- EM-jet in FMS

- Dataset: Run 17 ($\sqrt{s}$ = 510 GeV pp trans)

- Data-stream: FMS-stream

- Triggers: Small BS, Large BS and FMS-JP trigger

- Calibration from Minghui

- FMS hot channel masking before reconstruction

- Exclude highly bit-shifted FMS channels

- Production tag : P18ic

FMS Forward Meson Spectrometer
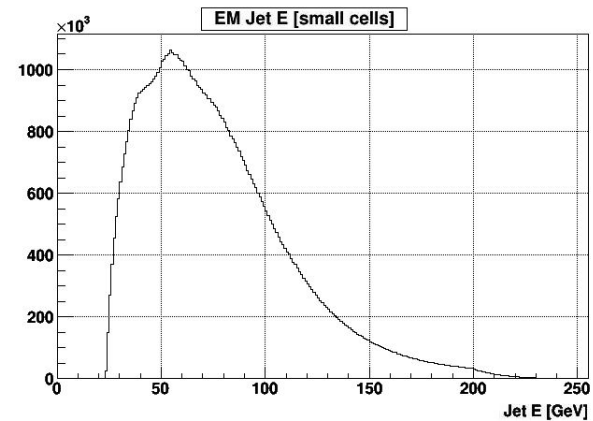
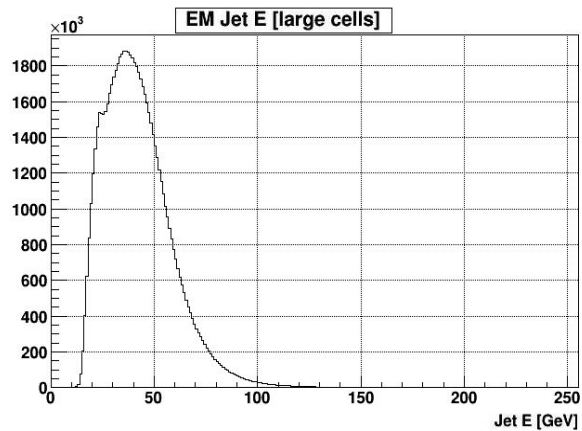**EEMC** Endcap Electromagnetic Calorimeter
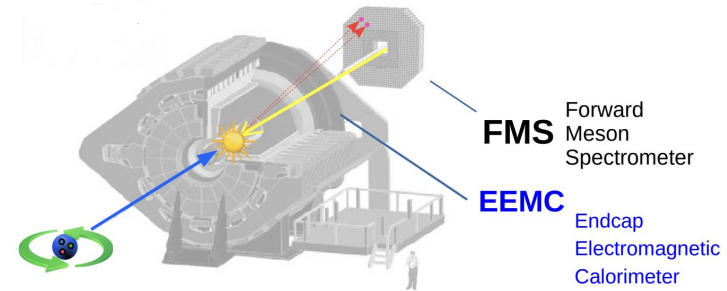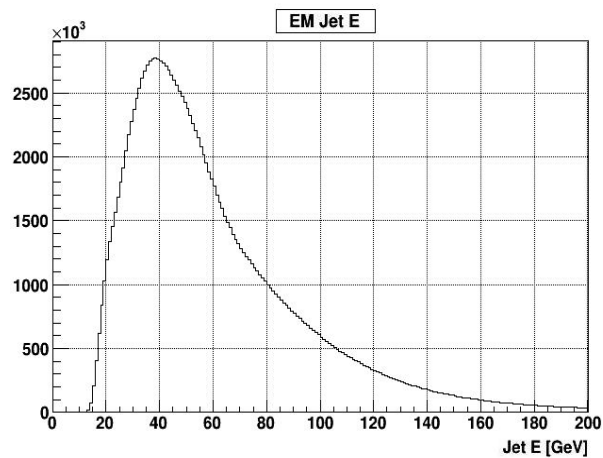
QA Plots: EM-jets and Trigger Types
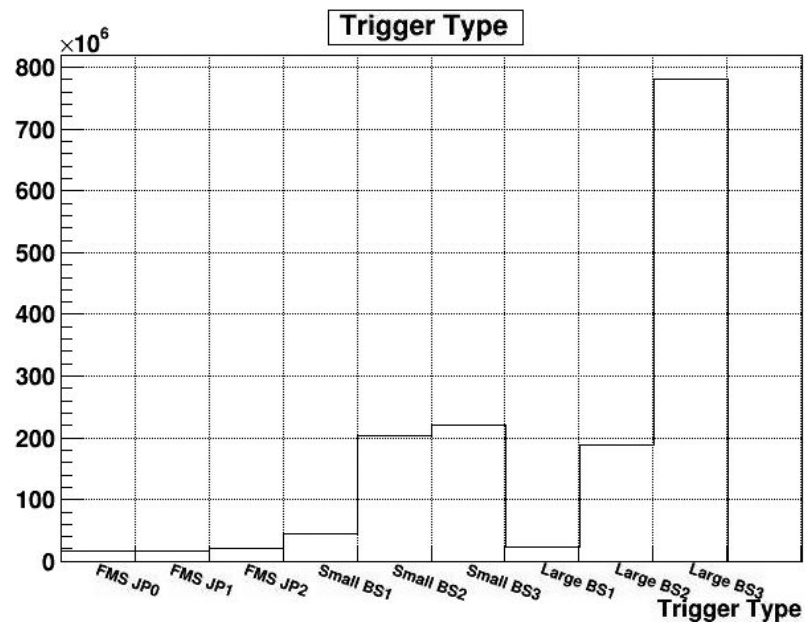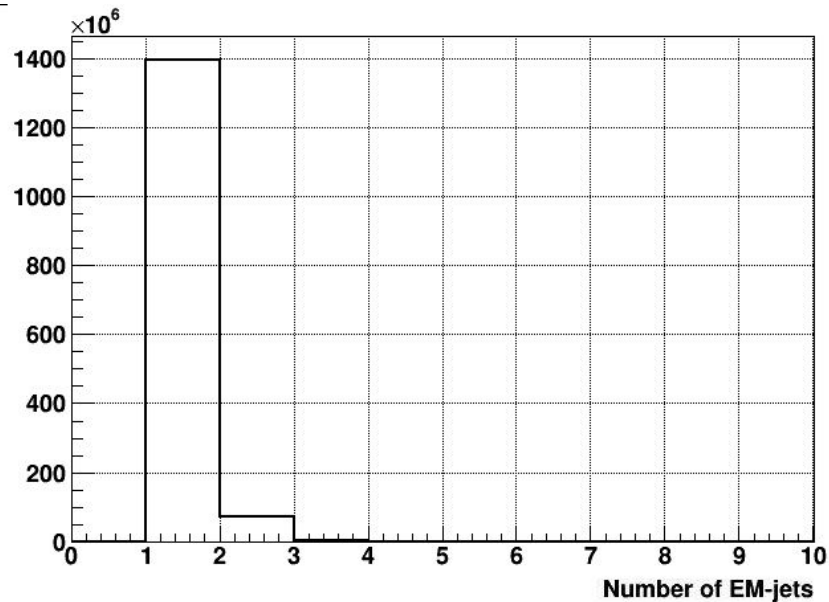
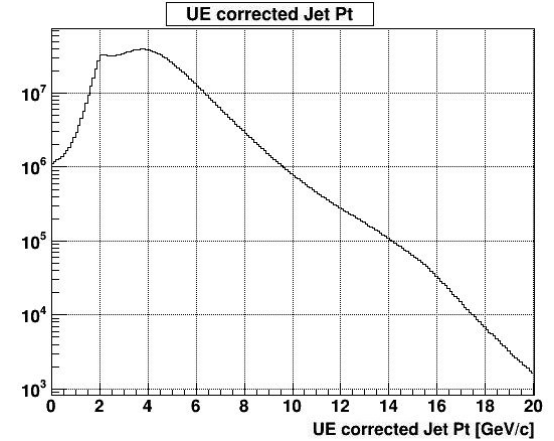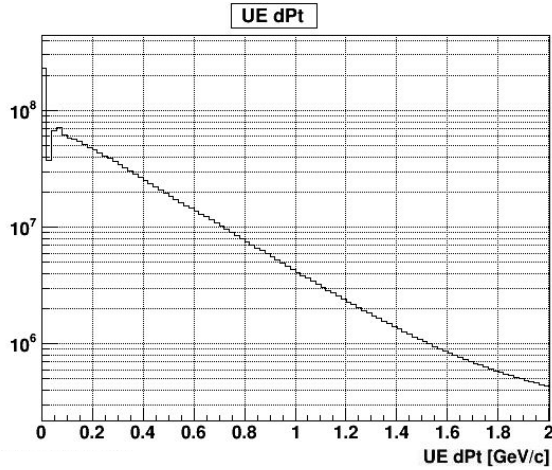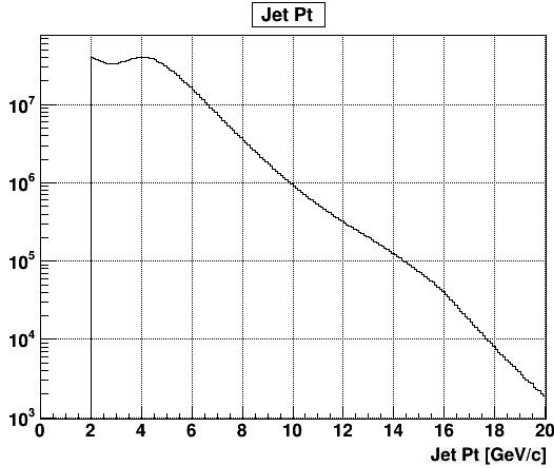# QA Plots: Photon Multiplicity and Vertex
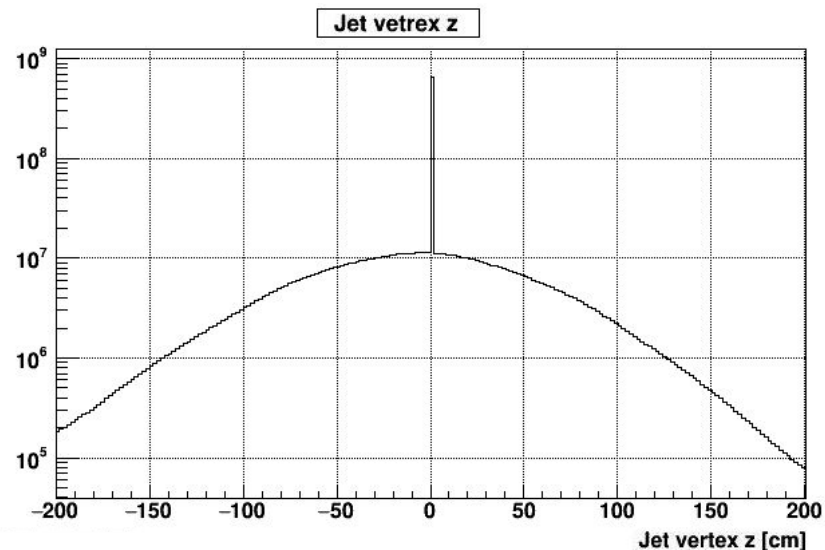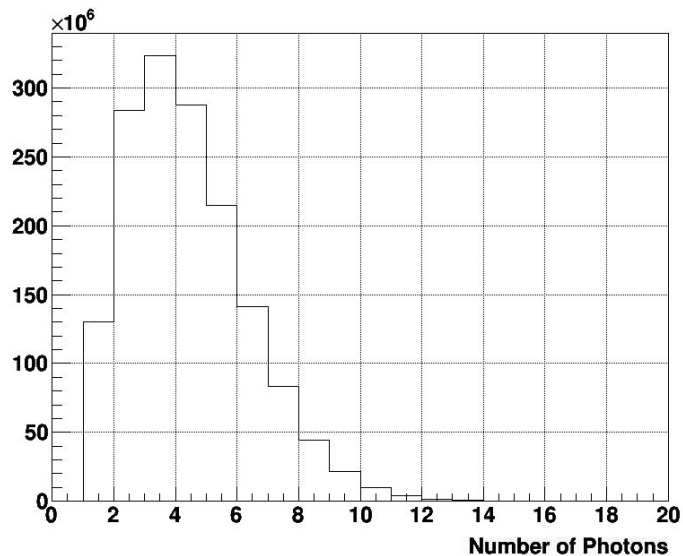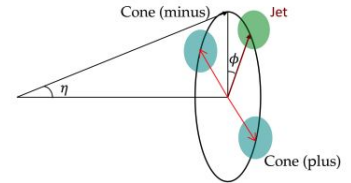

Vertex z priority => TPC, VPD ,and BBC
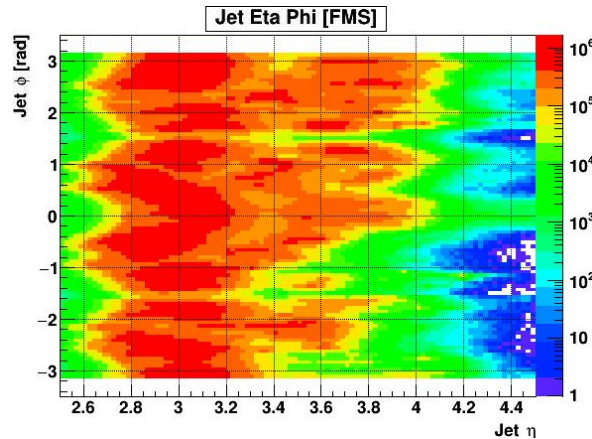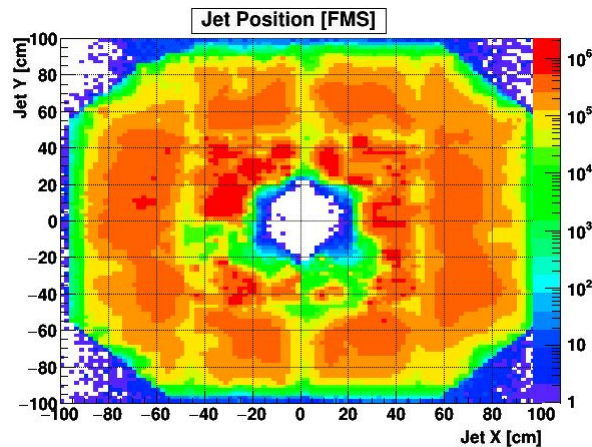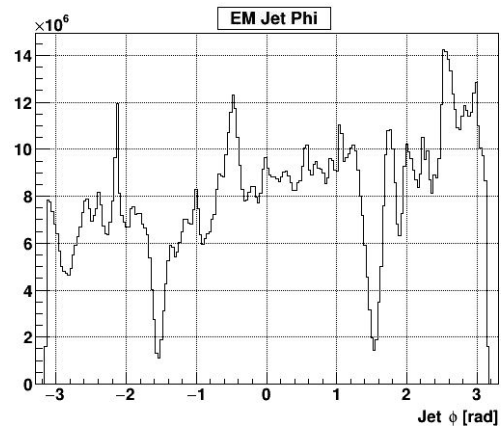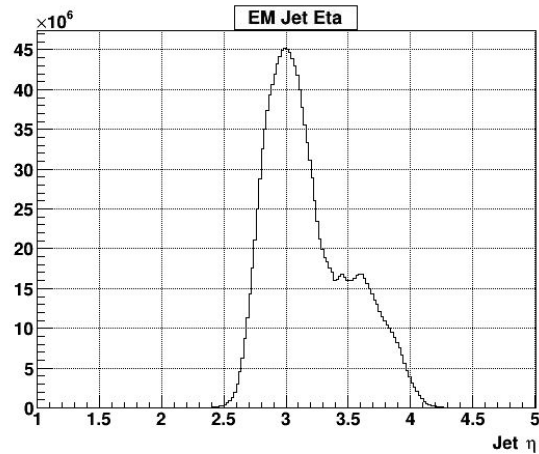
QA Plots: Jet Energy

QA Plots: Jet p_T

- EM-jet p_T values are corrected for contaminations from underlying events (UE) using off-axis cone method

- Correction to jet p_T, dp_T = Underlying Events Density x Area

- Corrected jet p_T = p_T - dp_T

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QA Plots: Angular distribution

EM-Jet A_N Extraction

A_N as a function of EM-jet p_T, energy, and photon multiplicity (FMS data)
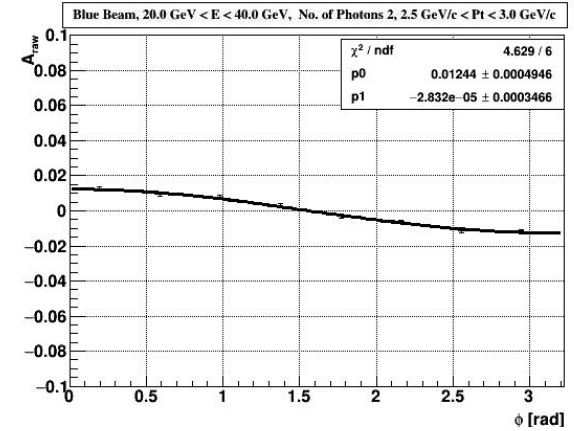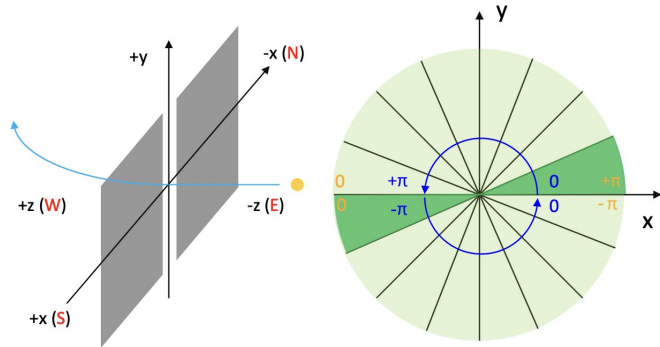
- Energy bins: [0-20] , [20 -40], [40 -60], and [60 -80] GeV
- 16 equal Φ bins in the range - π to π
- Upto 5 photon multiplicities bins
- Separately for $X_F>0$ and $X_F<0$

- Cross-ratio formula to calculate A_N

- Cancels systematics, such as luminosity and detector effects

$$\epsilon = A_N \times P \times \cos(\phi)$$

$$\epsilon \approx \frac{\sqrt{N_\phi^\uparrow N_{\phi+\pi}^\downarrow} - \sqrt{N_{\phi+\pi}^\uparrow N_\phi^\downarrow}}{\sqrt{N_\phi^\uparrow N_{\phi+\pi}^\downarrow} + \sqrt{N_{\phi+\pi}^\uparrow N_\phi^\downarrow}}$$

Blue Beam, 20.0 GeV < E < 40.0 GeV, No. of Photons 2, 2.5 GeV/c < Pt < 3.0 GeV/c

χ^2 / ndf   4.629 / 6
p0 0.01244 ± 0.0004946
p1 $-2.832\text{e}-05 \pm 0.0003466$

Conclusion and outlook

- QA plots looks okay

- Working on A_N extraction and systematic