Update on EM-Jet A_N Using FMS and EEMC

For Run 15 Dataset

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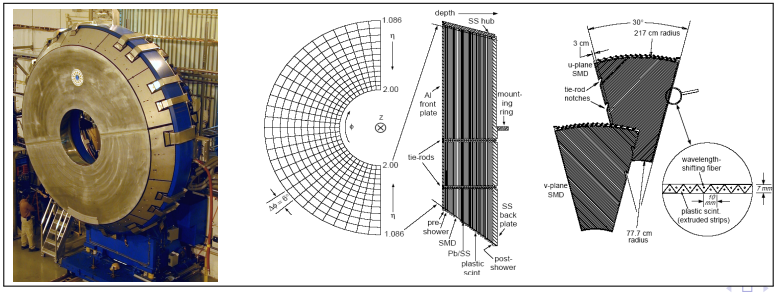
Update To EEMC EM-jet

Earlier version:

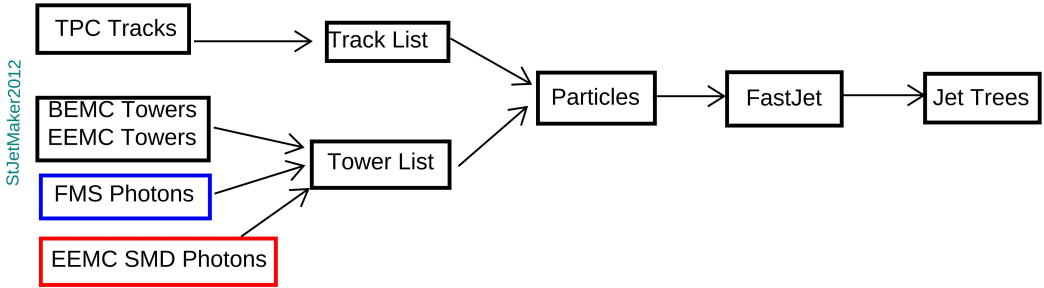
- Used EEMC tower + TPC tracks as input for jet finder
- EEMC tower size has eta dependence

Current version:

- Repeated the calculation with following modifications:
  - Used photon candidates made out of SMD + EEMC towers
  - Removed TPC tracks and kept only photon candidates
  - **Photon energy cut: 2.0 GeV**

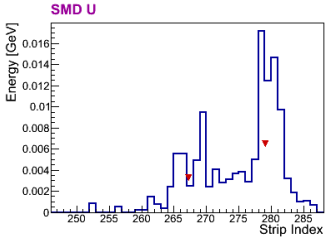


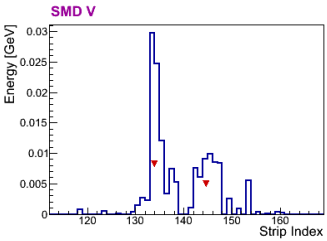
EM-jets with EEMC Towers Vs EEMC SMD Photons



Photon Reconstruction in EEMC/SMD: Same as used for 2006 EEMC Paper by S. Gliske, J. Webb et al.

- EM Particle Reconstruction Procedure
  - Identify clusters in the u and v strips
  - Determine which u and v clusters to associate with incident particles
  - Compute energy of incident particles (e.g. photons) from the towers
  - Compute momentum from the vertex and SMD cluster positions
- SMD response (right) in π^0 candidate event from data
  - Blue histograms show energy response per strip
  - Red triangles represent clusters drawn at mean strip position, and 10% of the cluster energy
- SMD clusters are found by
  - Smoothing the histogram using the method of J. Tukey
  - Identifying clusters as a strip above an energy threshold, with +-3 adjacent strips with monotonically decreasing energy
  - Setting cluster position to energy-weighted mean position of strips
- EM particle candidates built from pairs of u-v clusters
  - Clusters matched by energy of u and v strips
  - Required to have associated tower energy above threshold
  - Often have e.g. two photons from one π^0 deposited in one tower
- Reconstruction difficulties include
  - Upstream passive material: π^0 opening angle on the same order as photon conversions
  - Single particles sometimes look like two particles, and vice versa





*Slide taken from A. Gibson's talk

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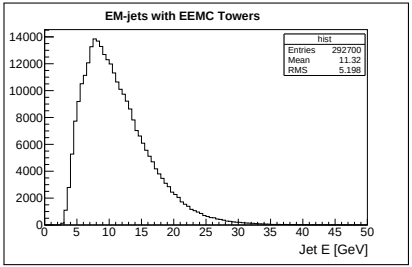

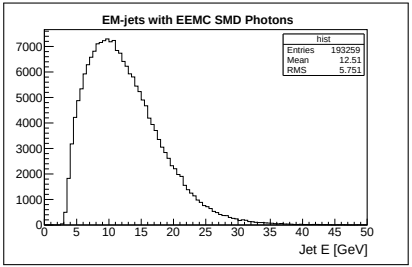

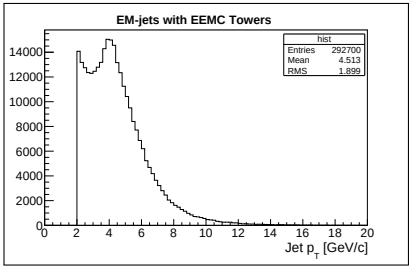

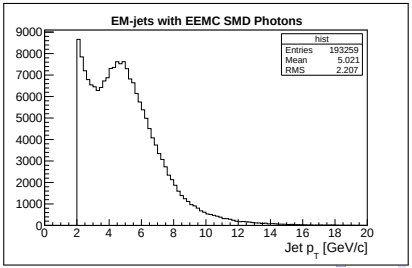

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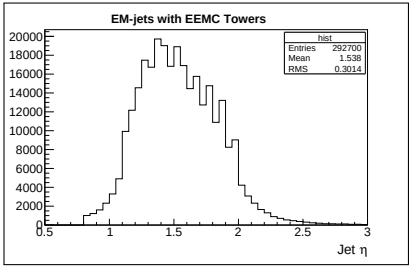

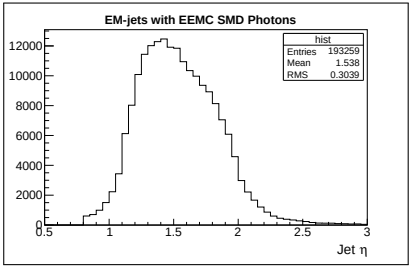

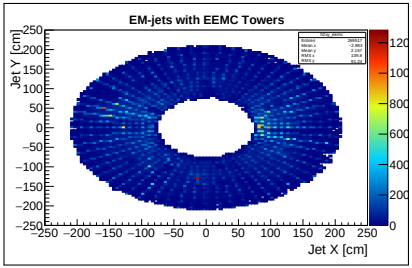

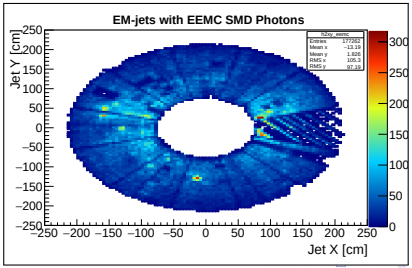

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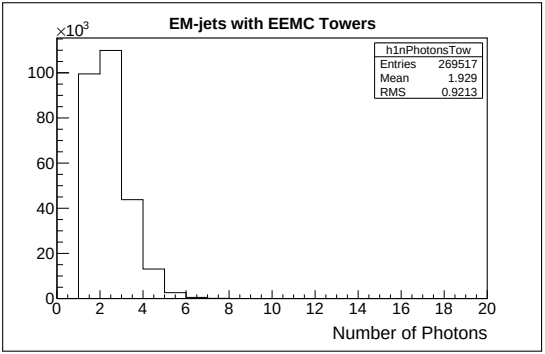

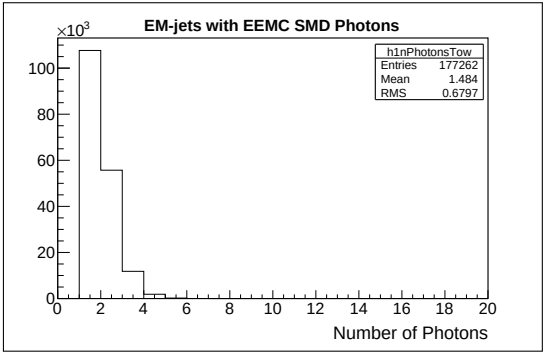

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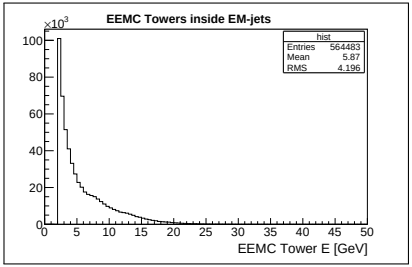

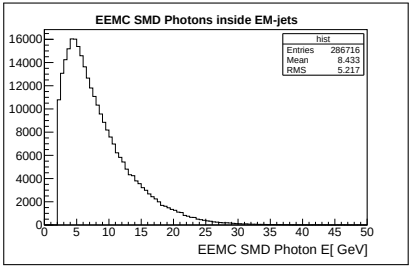

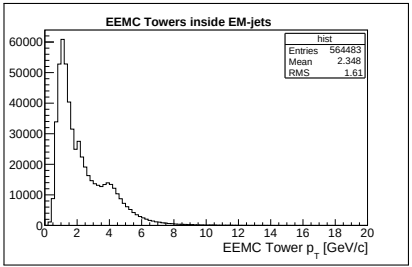

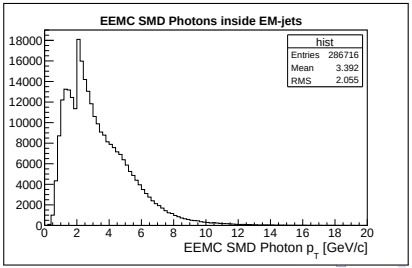

Summary

- $\sim$ 30% less statistics with EEMC SMD photons compared to EEMC towers.
- Jet E, p_T, photon multiplicity distributions will change to some extend depending on the choice of EEMC SMD photons vs EEMC towers.

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