Jet energy resolution in trigger v5 data

JES Meeting : May 22, 2002

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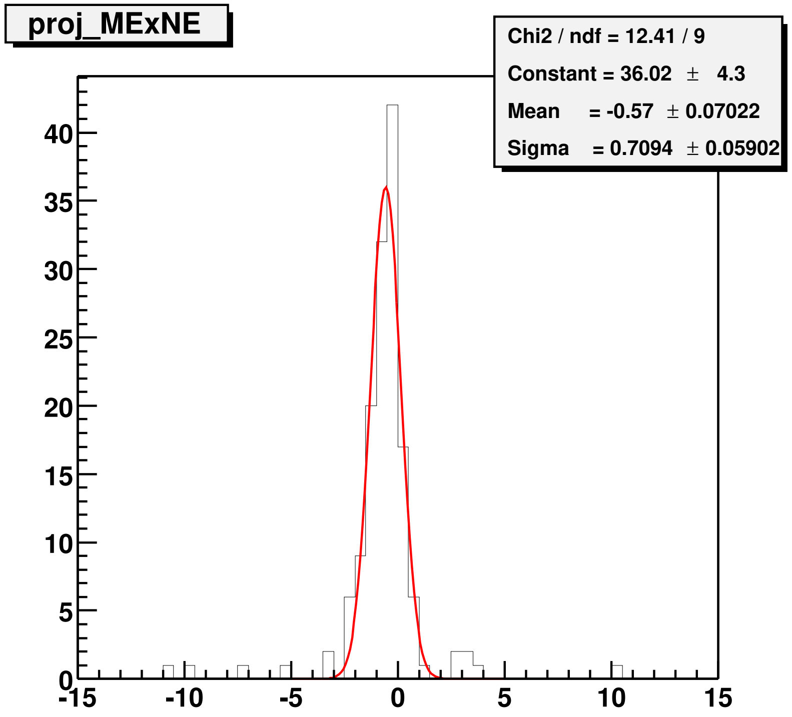
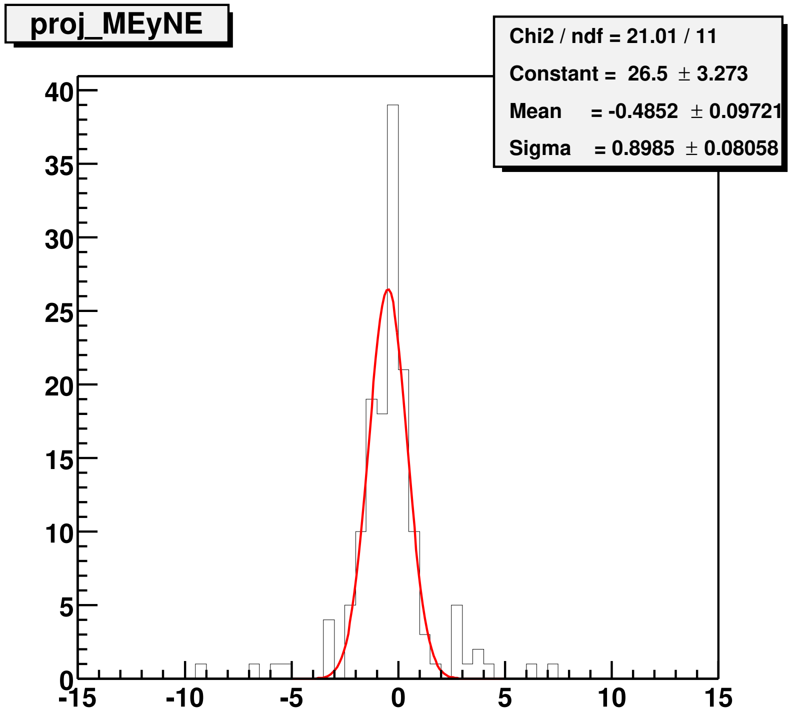
Trigger v5 data

Small ROOT tuples

- almost all trigger v5 data I have found on SAM a week ago (1473 files out of 1502)
- 150 runs, from 149269 (Mar 22) to 153368 (May 4)

Run selection





- 134 runs, 1389 files, and 3260113 events (in stipped files)
- 3006041 events in good LBNs
- $\mathcal{L}_{L1} = 3.26\,\mathrm{pb}^{-1},\ \sigma_{mbias} = 36.8\,mb$

Event selection

- Trigger selection
- *events that passed the following L3 triggers*
  - `min_bias, JT_25TT, JT_45TT, JT_65TT`
- Event selection
  - only dijet events (before and after application of jet selection criteria)
  - back-to-back criterium $\Delta\phi > 175^\circ$
  - primary vertex cut $|vtx_z| < 50\,\mathrm{cm}$
  - at least two tracks associated with the vertex
  - $MET < 0.7\, p_T^{leading\ jet}$
  - cut on calorimeter occupancy $EJthresh < 2\,\mathrm{TeV}$
- JES corrections (`jetcorr` v2.0)

Jet energy resolution

- asymmetry variable A

$$A = \frac{p_T^{jet1} - p_T^{jet2}}{p_T^{jet1} + p_T^{jet2}}$$

- gaussian fit on $|A|$ with fixed mean value at zero
- jet resolution

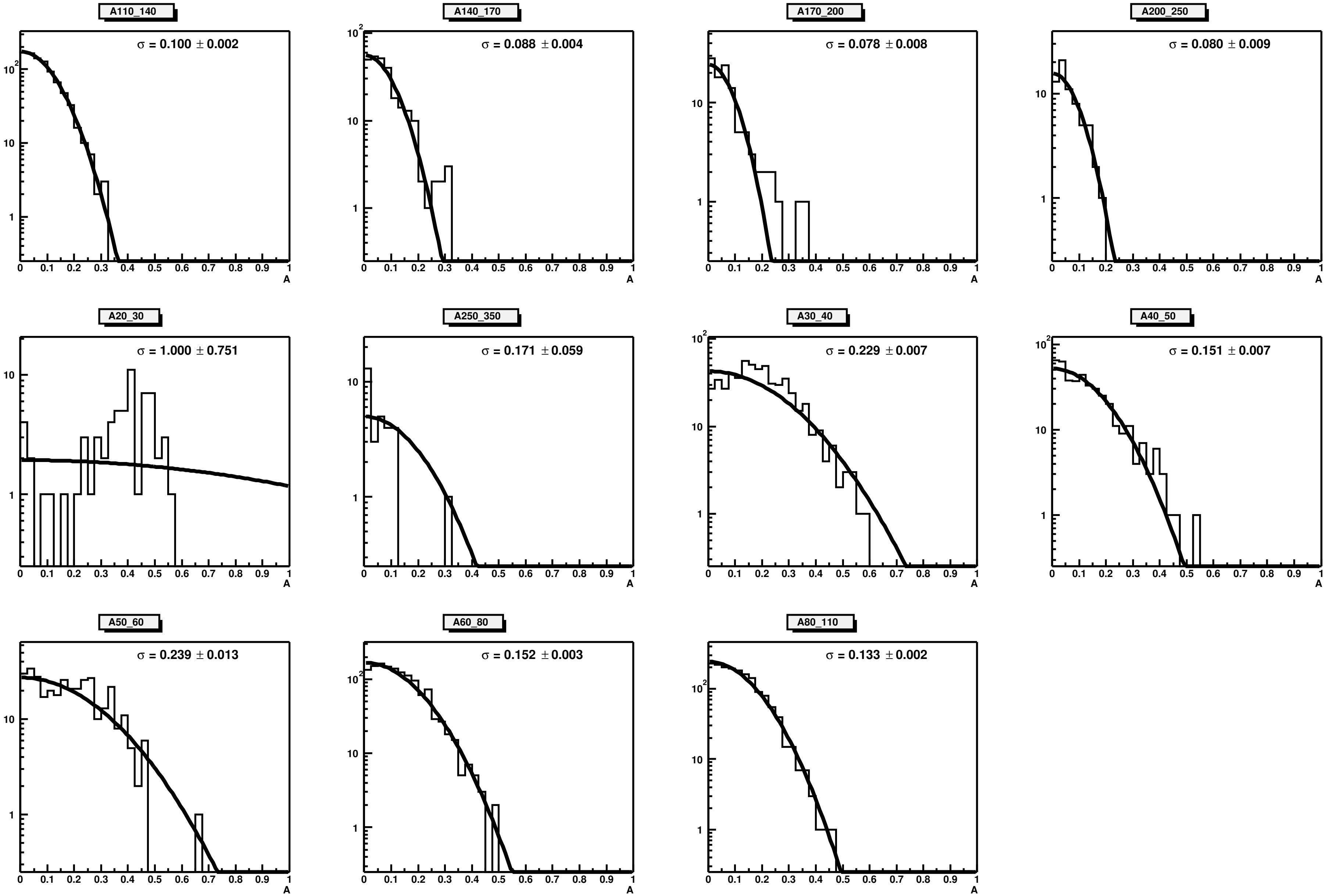
$$\frac{\sigma_{p_T}}{p_T} = \sqrt{2}\sigma_A$$

- final fit

$$\frac{\sigma_{p_T}}{p_T} = \sqrt{\frac{N^2}{p_T^2} + \frac{S^2}{p_T} + C^2}$$

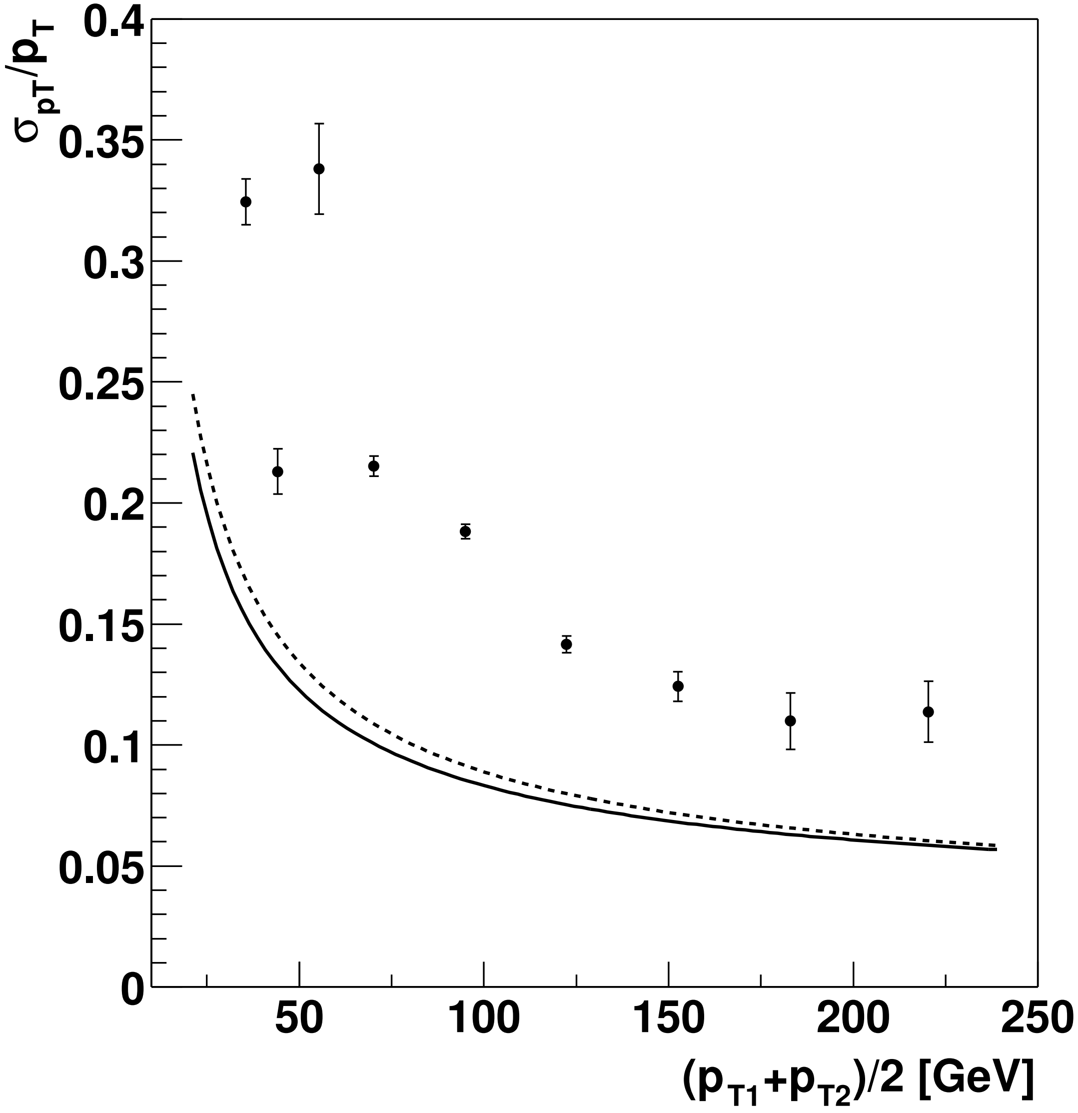
- no soft radiation correction
- no correction for particle jet imbalance

p_T asymmetry in the data for cone $\mathcal{R}$=0.7

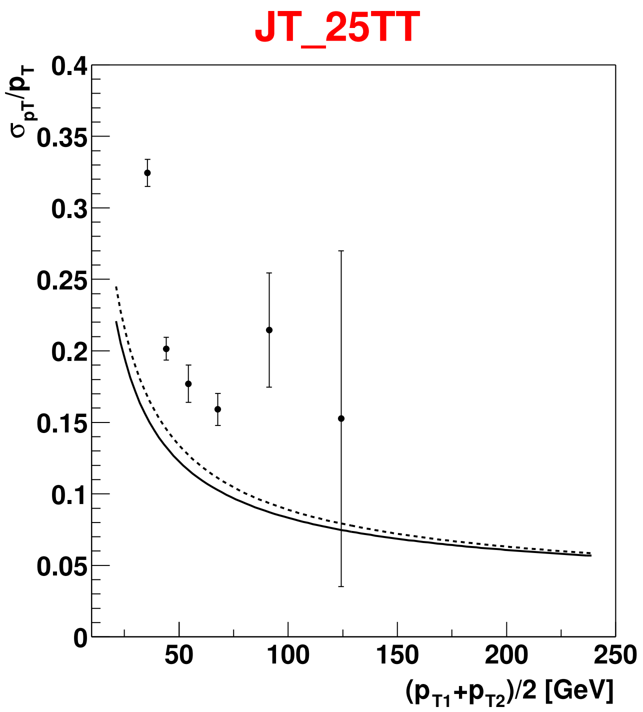


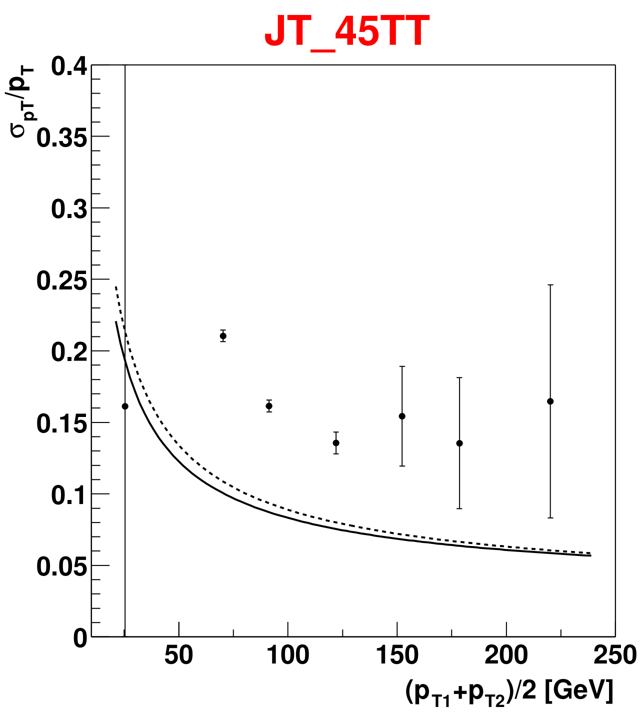
resolutions - no trigger thresholds

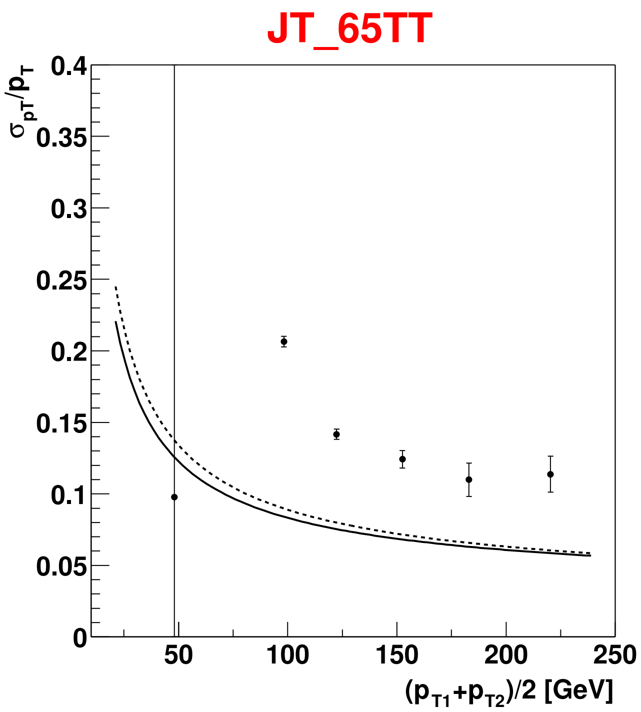
- events that passed L3 jet triggers



resolutions trigger by trigger







resolutions - final plots

- ▷ *trigger selection*
  - *based on the shape of assymetry variable A*