Jet energy resolution in the data after mid of August

DØ Collaboration Meerting, JES Group

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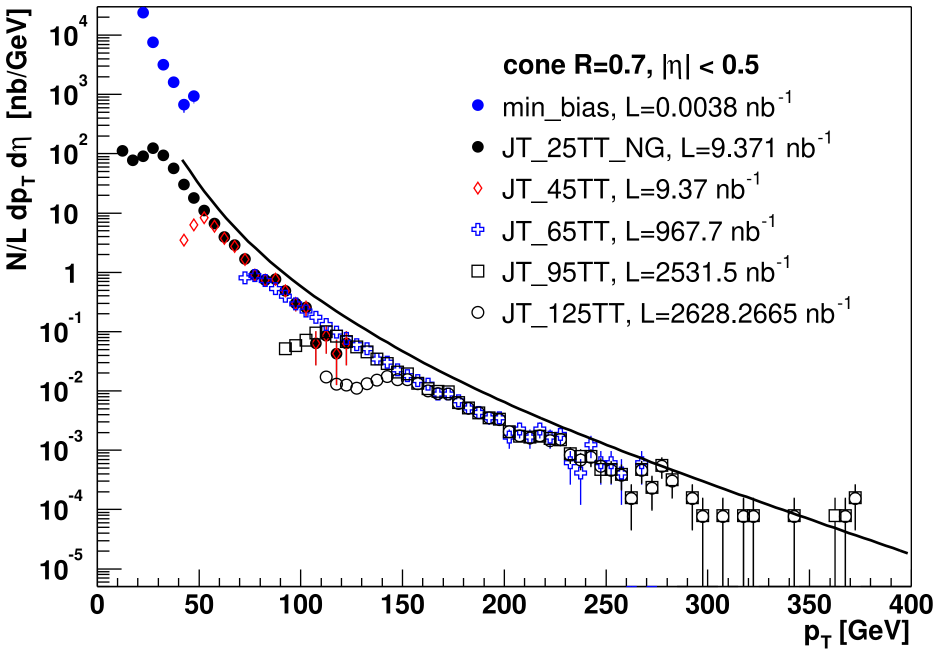
Data Sample

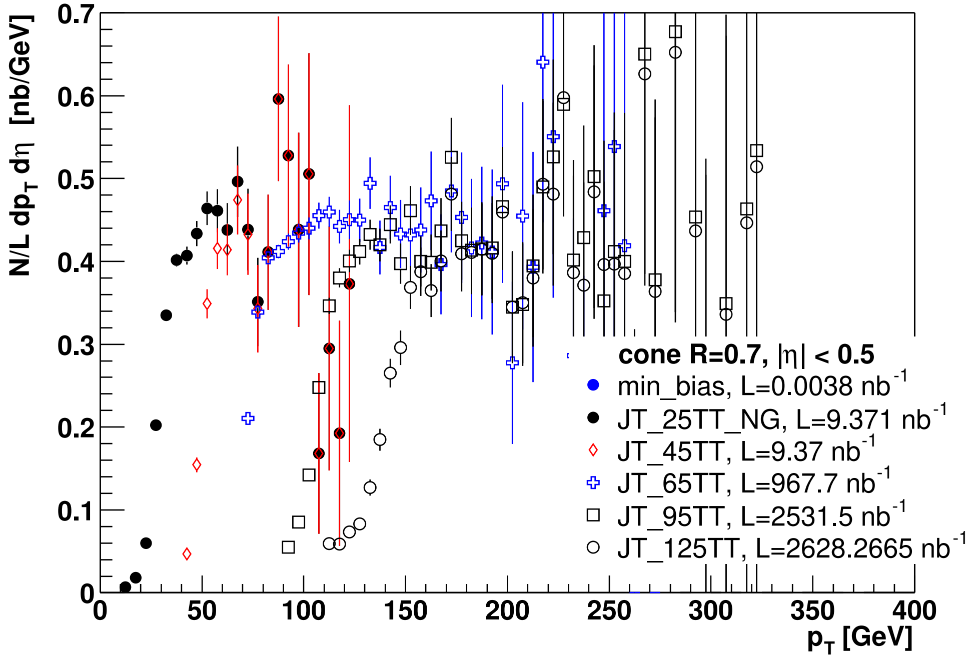
- data taken with triggers CMT-8.20 and CMT-8.30
- reconstructed with `p11.11.00` and `p11.12.01`
- about 12 million events, luminosity $\mathcal{L} \sim 4\,\text{pb}^{-1}$
- looked at events that passed the following triggers
  - `JT_25TT_NG` (~ 70 k events)
  - `JT_65TT`, `JT_50TT_JT_65PV` (~ 300 k events)
  - `JT_95TT`, `JT_70TT_JT_95PV` (~ 300 k events)
- event selection
  - just 2 jets in the event, back-to-back ($\Phi > 175°$), $|\eta^{jet}_{1,2}| < 0.5$
  - both jets satisfy the standard jet quality cuts
  - $MET < 0.7\, p_T^{leading\ jet}$
  - at least two tracks associated to the primary vertex
  - cut on primary vertex position, $|vtx_z| < 50\,\text{cm}$
- no jet energy scale correction applied

Trigger turn-ons

Jet inclusive p_T spectrum



Comparison with theory



- JT_25TT_NG turns-on at $50\,\mathrm{GeV}$
- JT_65TT turns-on at $110\,\mathrm{GeV}$
- JT_95TT turns-on at $160\,\mathrm{GeV}$

Method

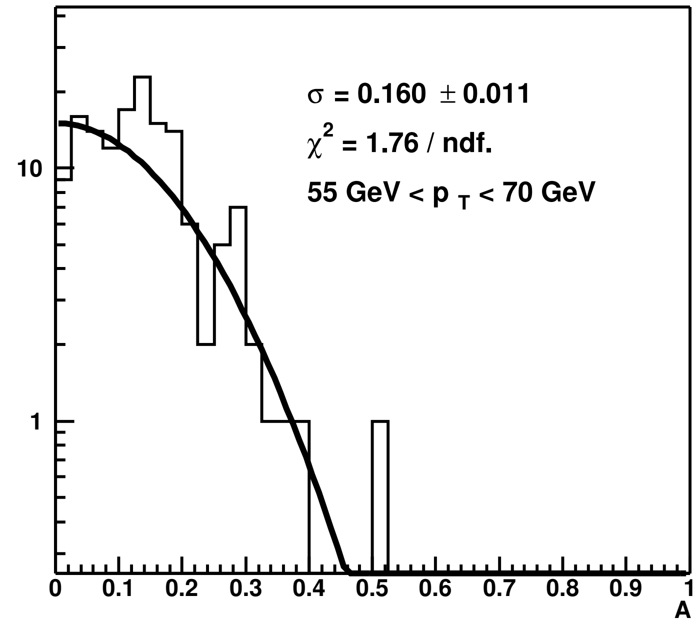
- asymmetry variable A

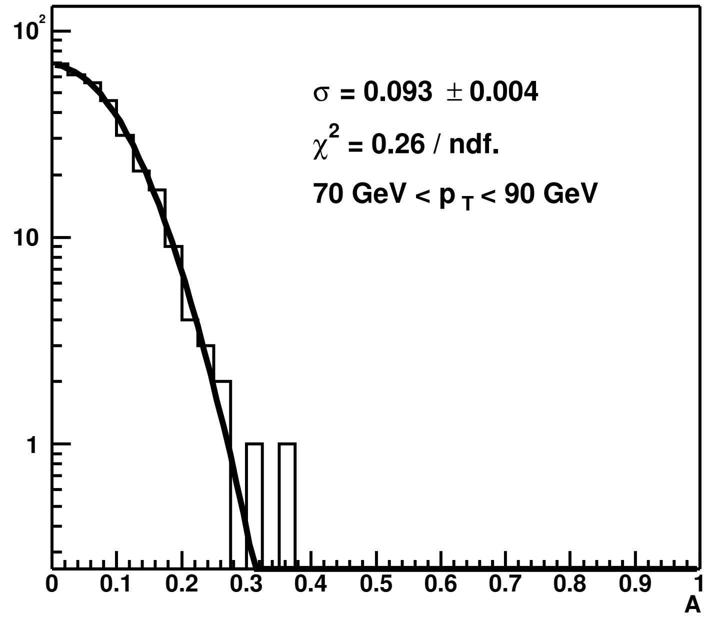
$$A = \frac{p_T^{jet1} - p_T^{jet2}}{p_T^{jet1} + p_T^{jet2}}$$

- jet resolution

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

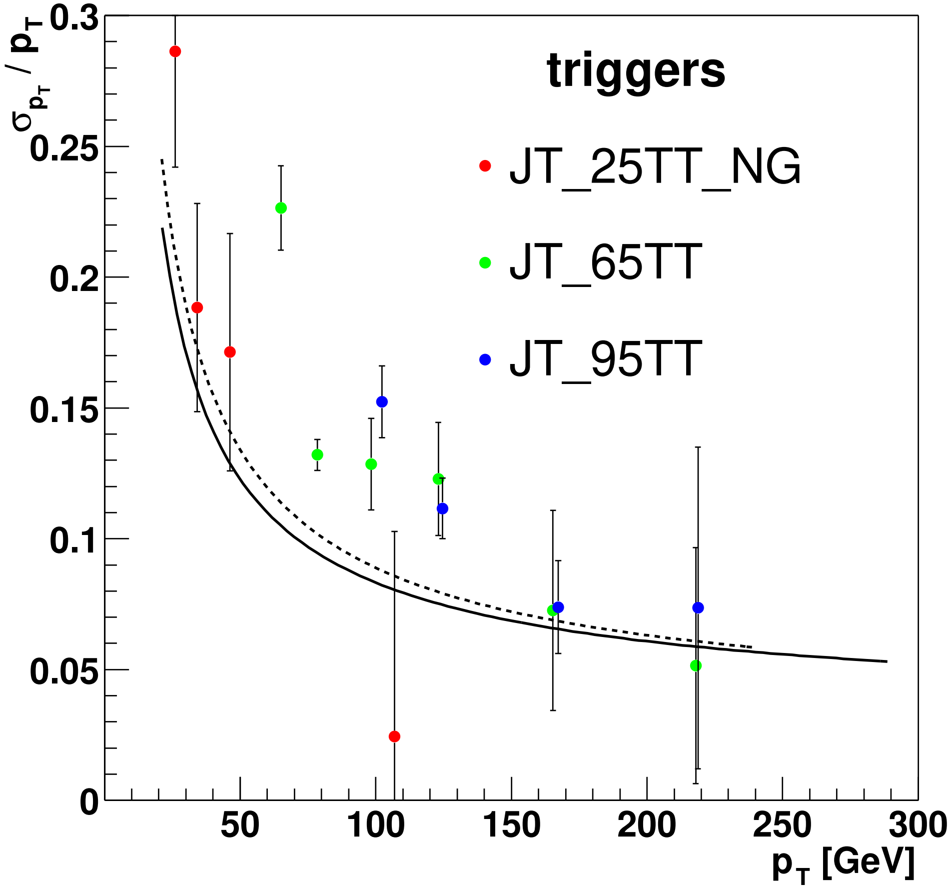
- no soft radiation corrections
- no correction for particle jet imbalance



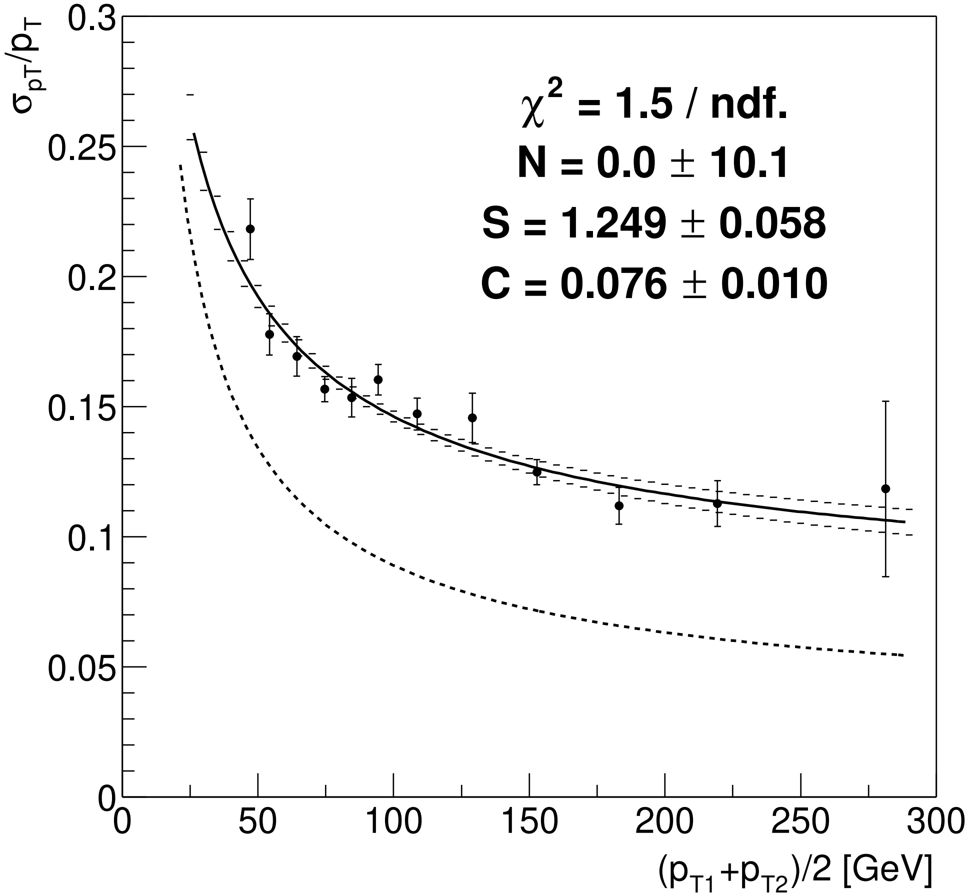


jet resolutions for cone $R = 0.7$

p11



p10



Summary

- very preliminary result
  - small statistics
  - mean value of the number of jets per event is arround 5!
  - still biased by trigger turn-ons
- jet energy resolution is better in the latest data (with non-linearity corrections) than in the data in the first half of the year
- it is still not as good as in RunI