Jet Energy Scale Calibration with g+jets events

Status Report (16-jul-01)

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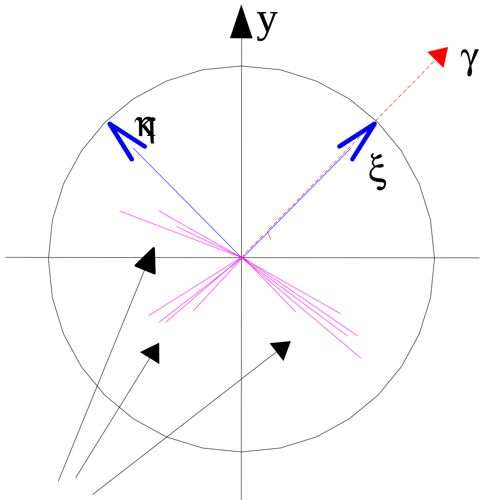
Method Overview

- Balance photon p_t against jets
  - relies on good em-scale
- Use standard cone algorithm (0.5)

- Goals
  - JES from p_t-balance (α_{j}
  - improve $p_{t,miss}$ resolutio (α_{UE})

- Objects:
  - em-cluster 1.0
  - Jets α_{jet}
  - unclustered energy α_{UE} (underlying event, pile-up etc.)



Projections

View everything in the transverse plane

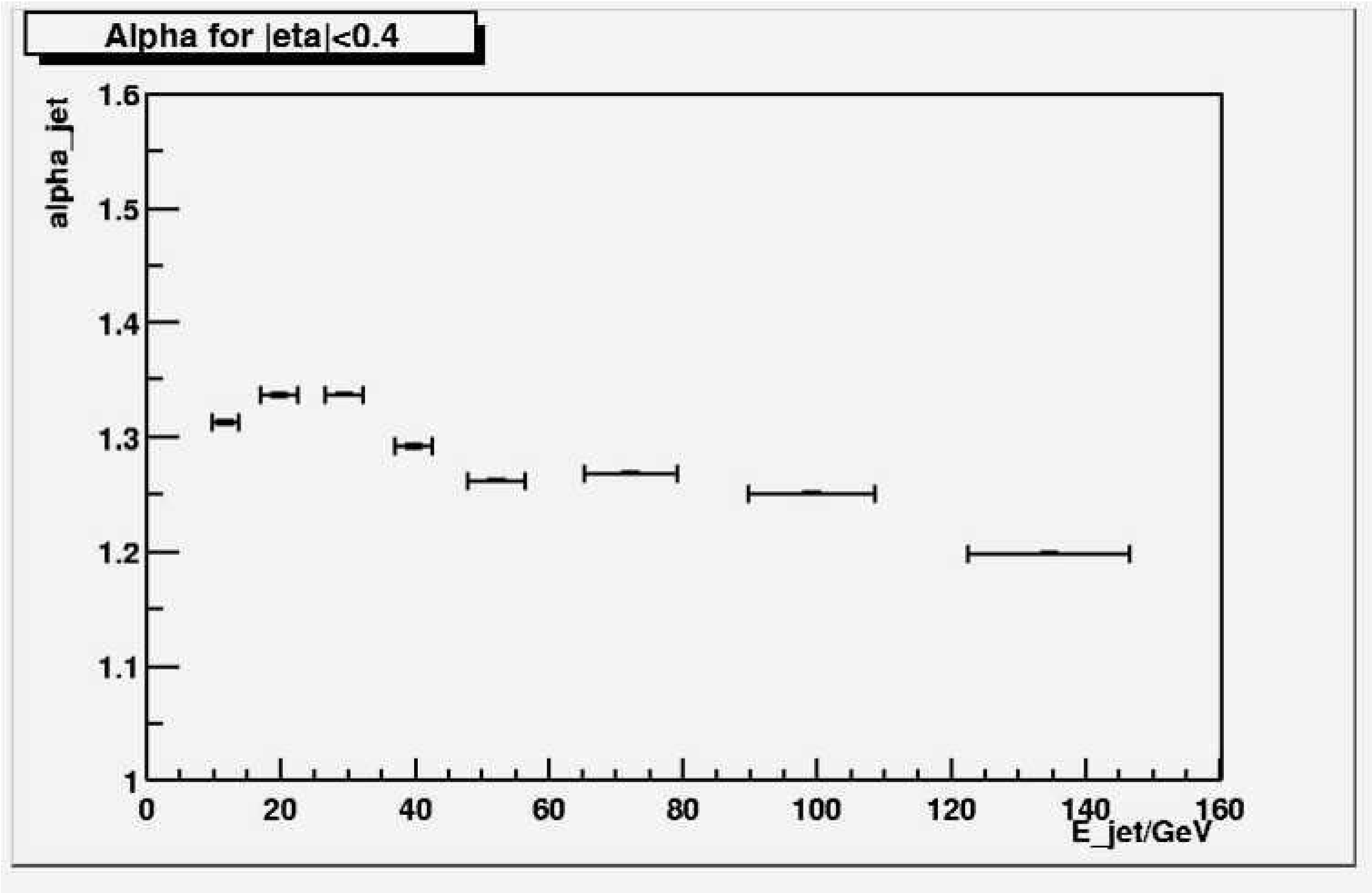
Project all jets on the photon direction(ξ) and transverse to it (κ)

Minimize with χ_1 and verify with χ_2

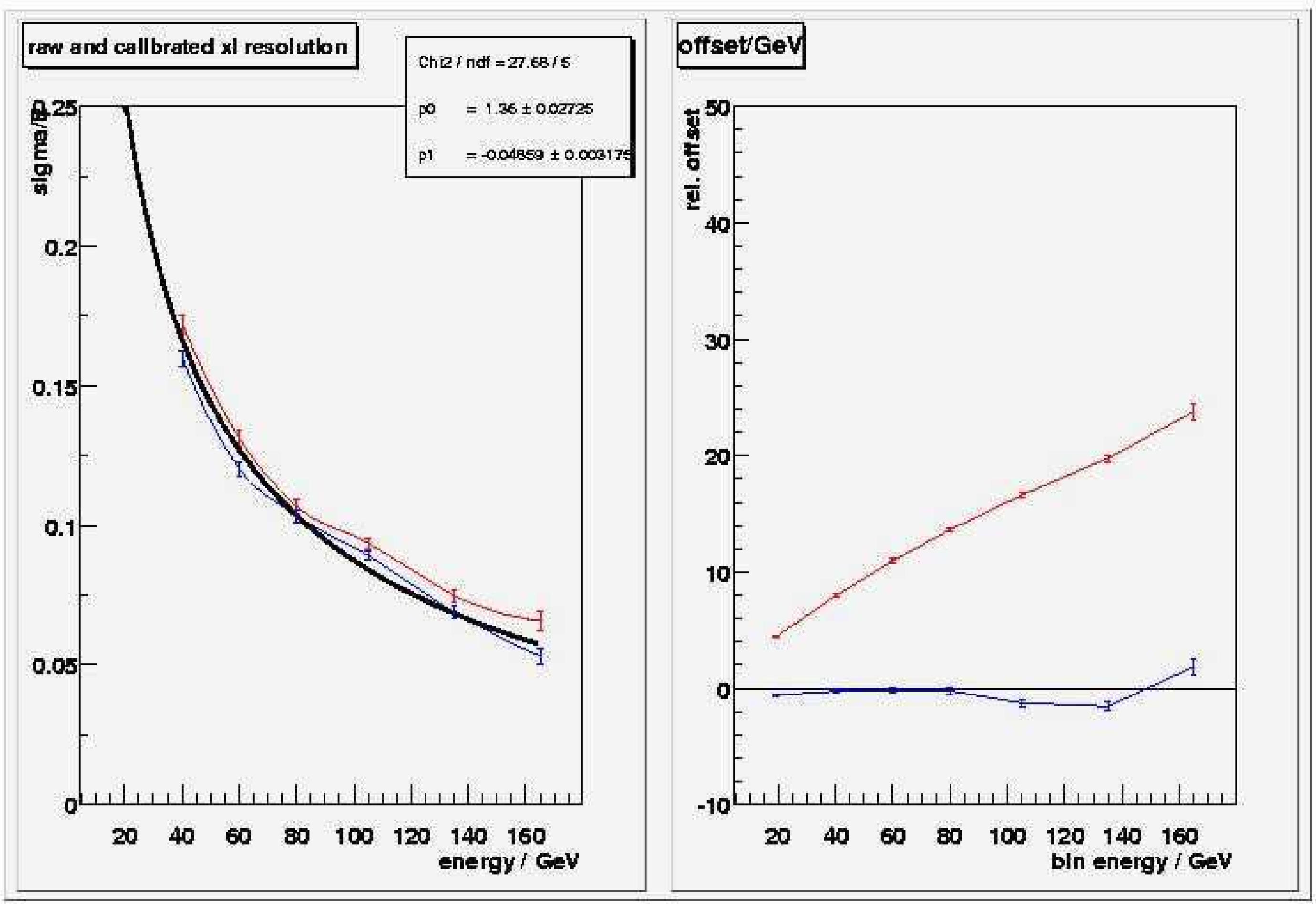
$$\chi_1^2 = \sum_{i=1}^{N_{event}} \left(E_\gamma^\xi - \sum_{k=1}^{N_{jet}} f_{layer} \alpha_{jet}(E,\eta) E_\xi(jet_k) - \alpha_{UE} E_{UE}^\xi \right)^2 / \sigma_{jet}^2$$

$$\chi_2^2 = \sum_{i=1}^{N_{event}} \left(\sum_{k=1}^{N_{jet}} f_{layer} \alpha_{jet}(E,\eta) E_\kappa + \sum_{l=1}^{N} \alpha_{UE}(E) E_{UE}^\kappa \right) / \sigma_{jet}^2$$

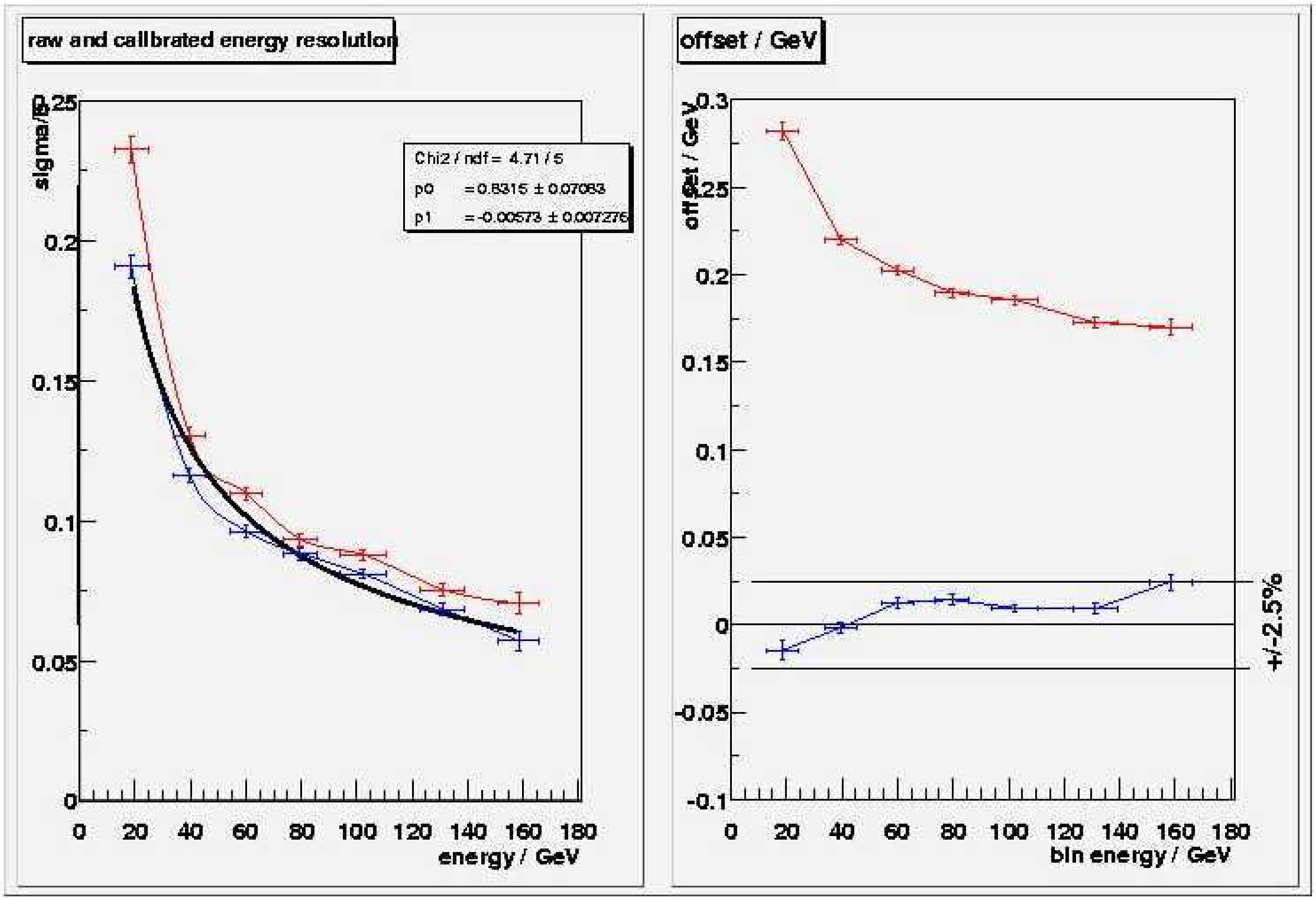
correction coefficients



momentum balance in ξ direction



energy resolution for jets (vs. MC jets)



outlook

understand offsets in first & last bin

implement $\alpha_{UE}(E_{cell},\eta_{cell})$

study $p_{t,miss}$ resolution

study dijet mass resolution and scale (Z->qq)

apply method to b-jets