Jet Energy Scale status and prospects

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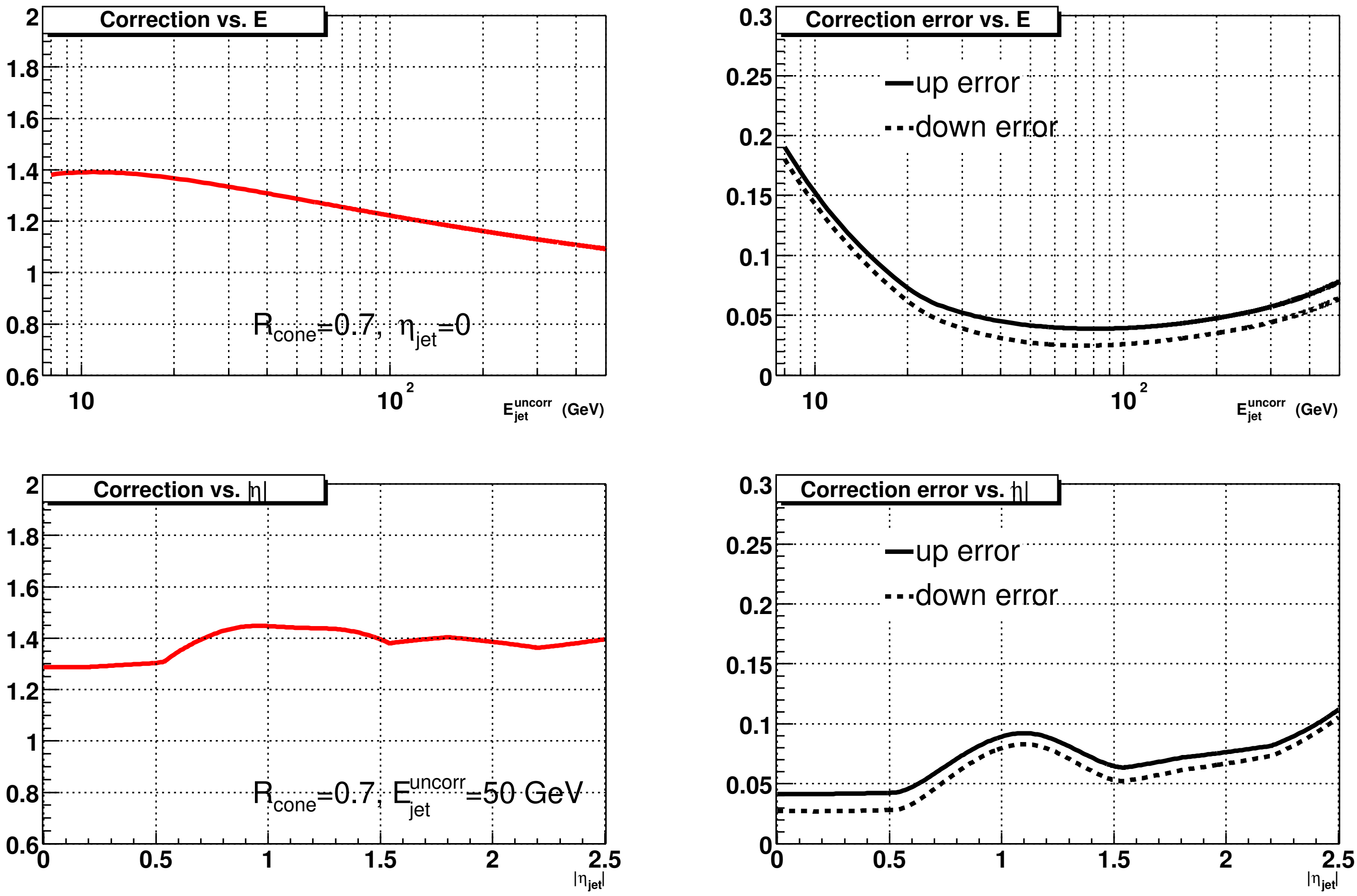
Contents:

- JES activities and plans: offset, showering, response, resolution, closure tests
- JES uncertainty discussion
- JES prospects

Datasets

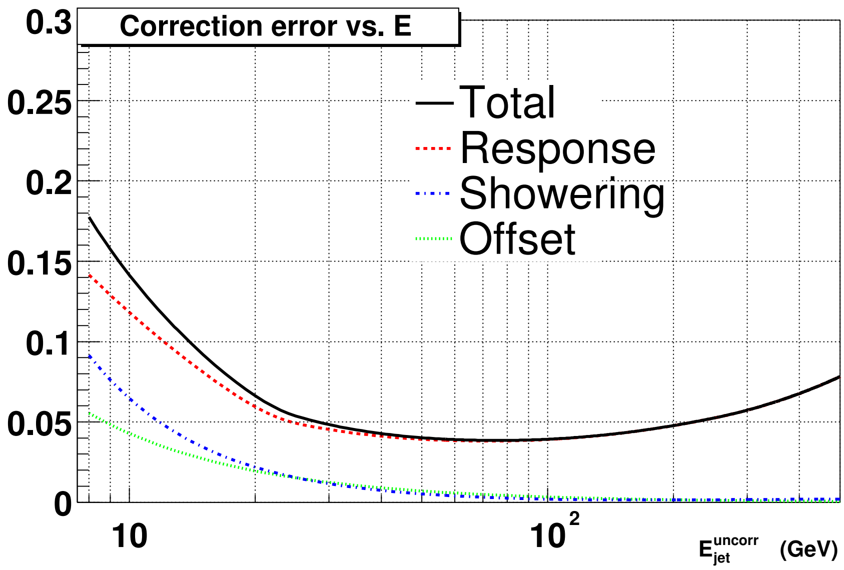
- Dataset: PASS 2 data, JES γ+jet and QCD jet skimming, being finalised
- Results and discussions: coming from PASS 1 data after tmb fixings
- Root tuple production: QCD root-tuple (Alexander Kupco, Christophe Royon) and Top group root-tuple (Vancouver group)
- Dedicated root tuples for showering studies (both dijet and γ+jets): containing all calorimeter cells, not all luminosity needed (Jeroen Hegeman, Christophe Royon)
- Deadlines: Preliminary version of JES with PASS 2 data by beginning of December (all components to be ready by mid-November)

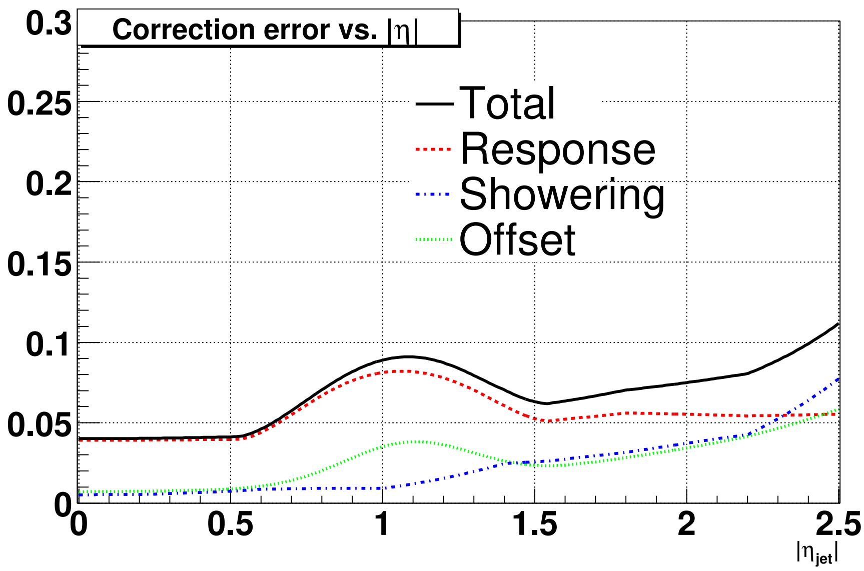
JES corrections: v5.3



JES systematics: v5.3

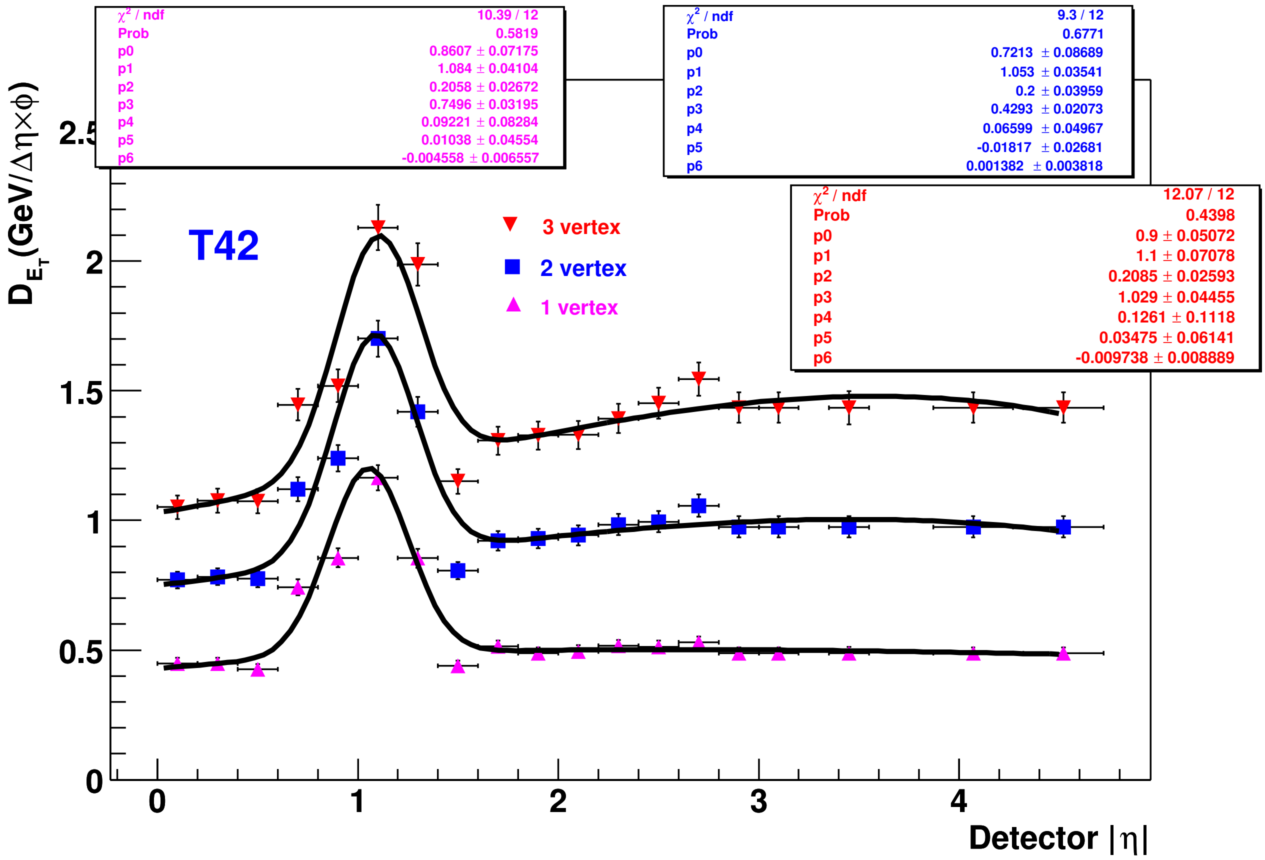
In CC: largest systematics: jet response, in EC: showering at high η





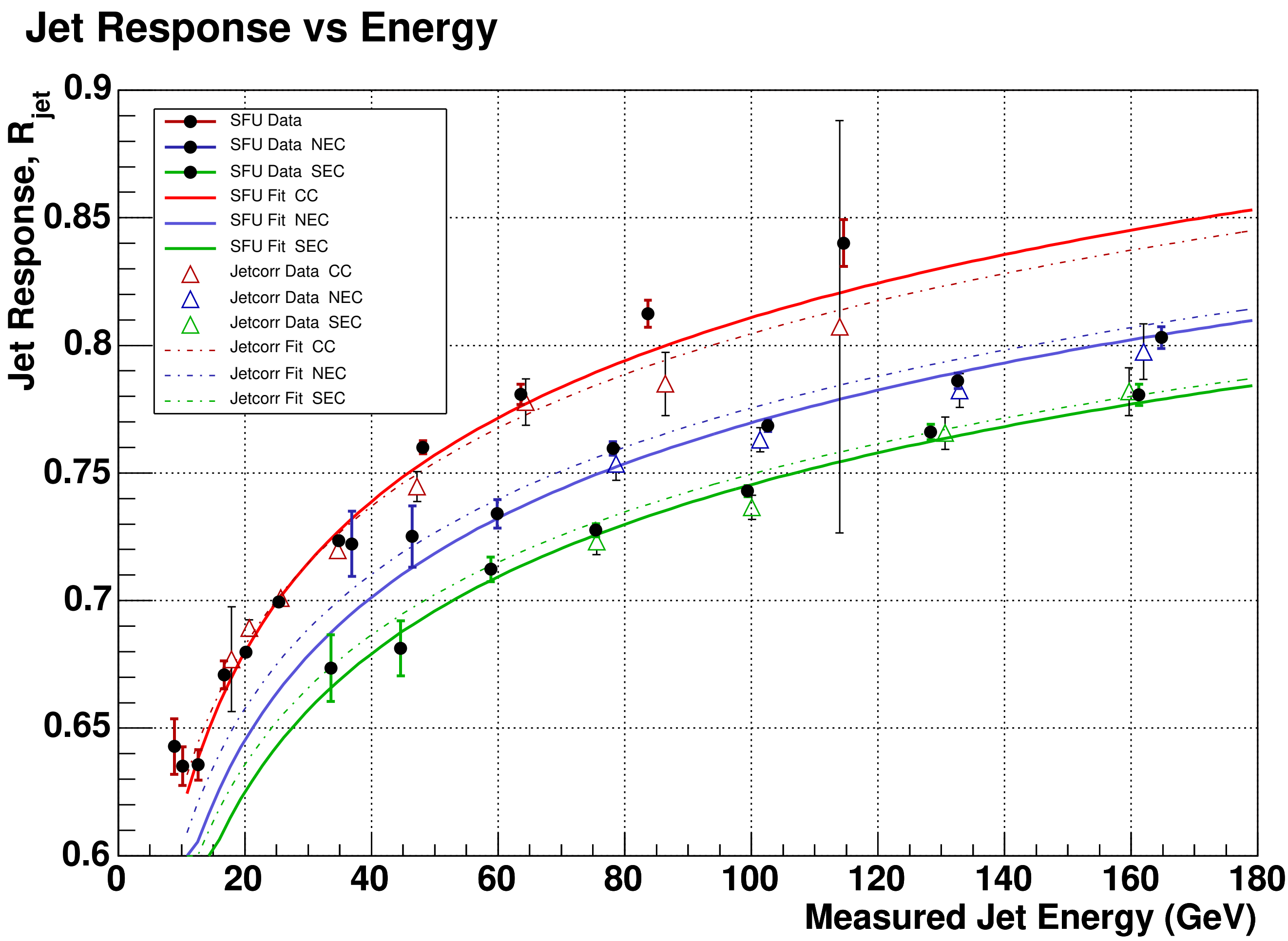
Offset corrections

- Study offset corrections (Nirmalya Parua, Subhendu Chakraborty) for different instaneous luminosity
- Study already performed with T42 data, cross checks to be done



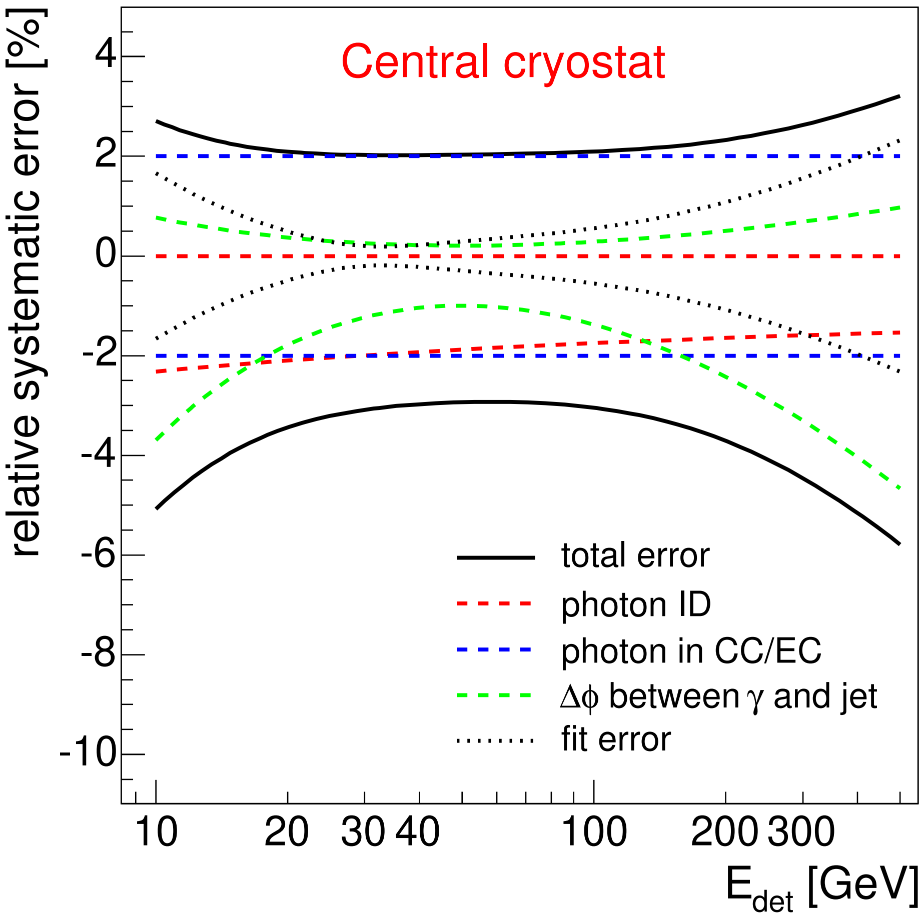
Jet response

- Measurement of the Jet response using γ+jet events (Alexander Kupco, cross check by Dag Gillberg, Yann Coadou, ... (Vancouver team))



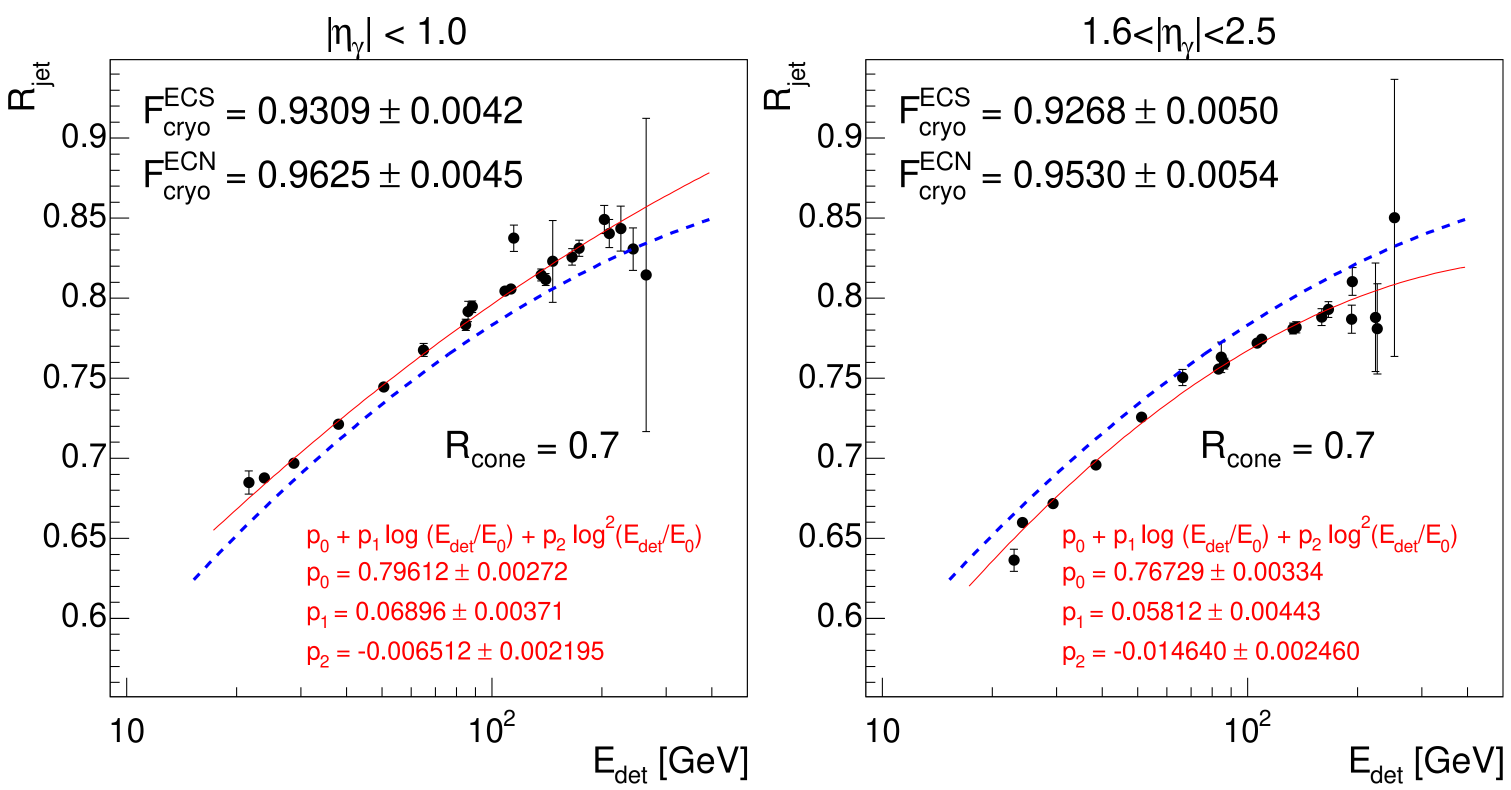
Jet response: uncertainties

- Systematics on response (Alexander Kupco)
- Largest syst.: EM scale in CC, different cuts on $\Delta\Phi$ between photon and jets



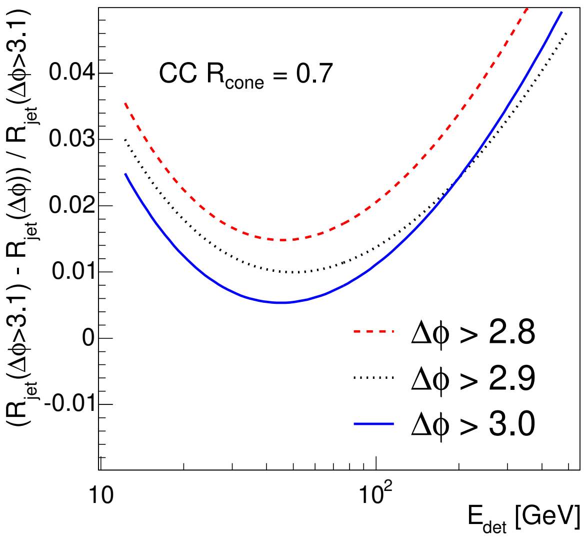
Jet response: uncertainties

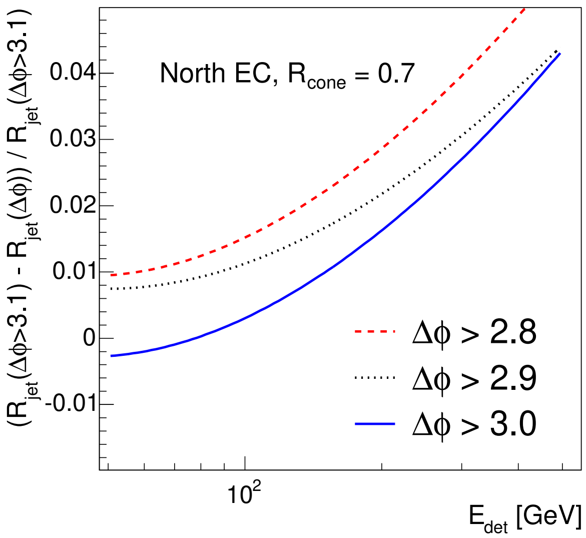
- Differences on jet response due to position of γ in EC or CC
- Expected improvement with new EM scale, (may be γ Id as well)

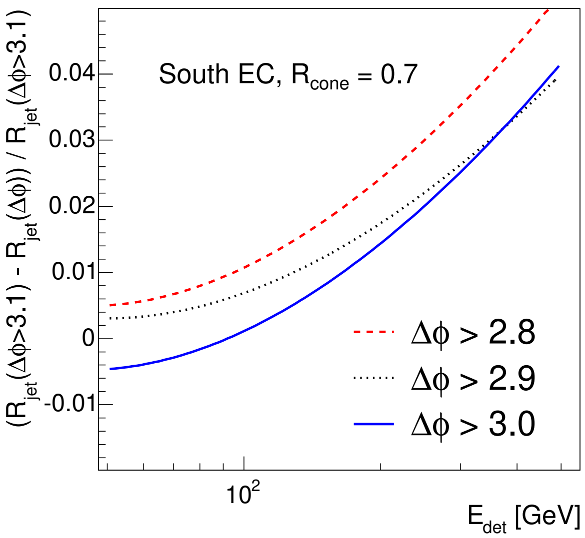


Jet response: uncertainties

- Uncertainty due to differences obtained with different $\Delta\Phi$ cuts
- Improvements: better stats (p14), ϕ-dependence of calibration factors (p17)





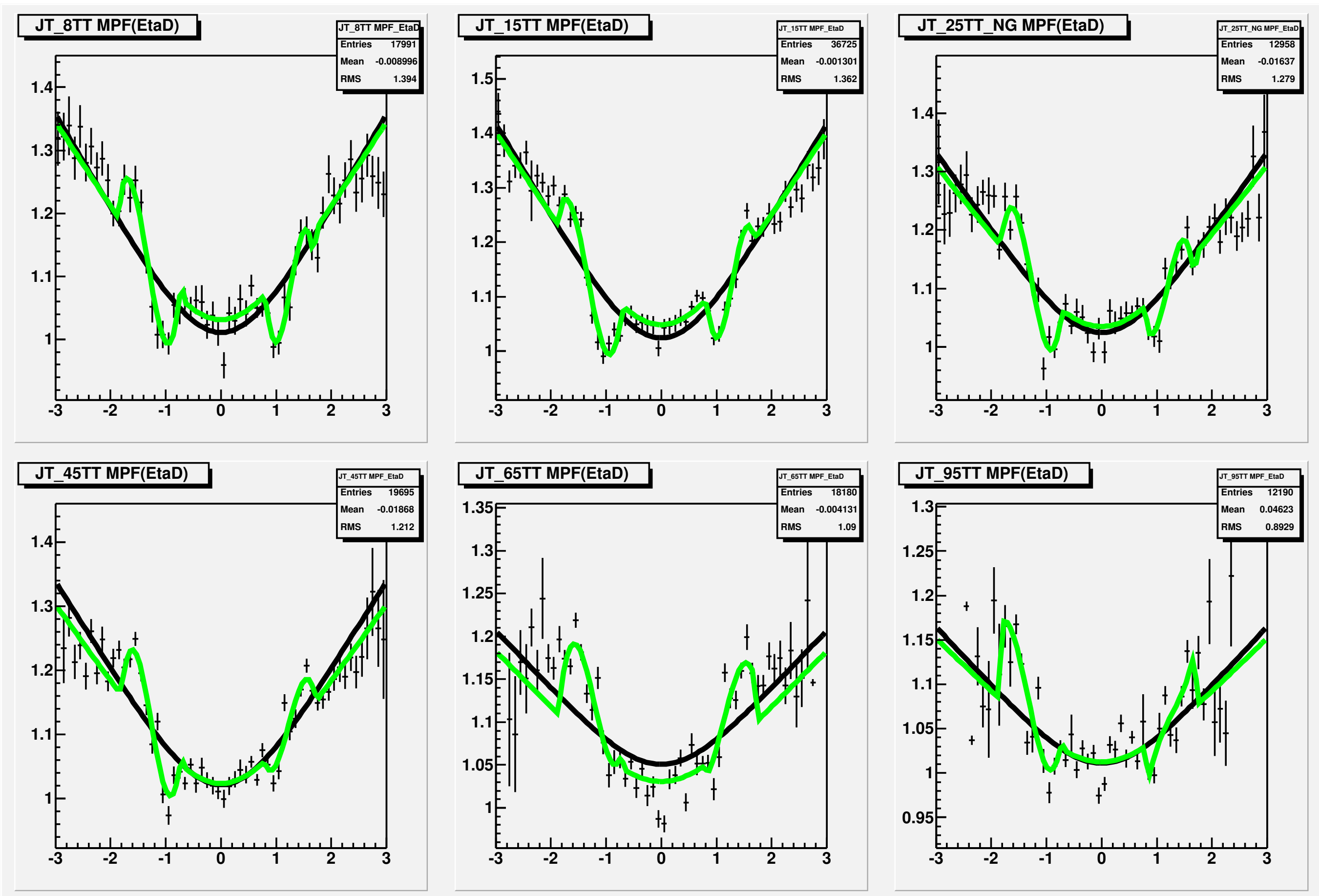


Discussion on jet response: uncertainties

- Uncertainty on response: largest uncertainty in CC
- Discrepancy between Dag and Alexander: still being investigated, many differences already found
- EM scale: Largest uncertainty especially in CC, improvements expected (p14 and p17)
- Dependence on $\Delta\Phi$ cut between γ and jet: reason unclear, to be investigated in more detail with more stats
- Dependence on jet Φ: big effect, reason still unknown, to be investigated, might change with new calorimeter calibration (p17)
- Jet EMF dependence: studied (Alan Magerkurth), studies to be pursued, depends on fluctuations on hadronic energy
- Low E_T jets: lower threshold to reconstruct jets (3 GeV), Vancouver team

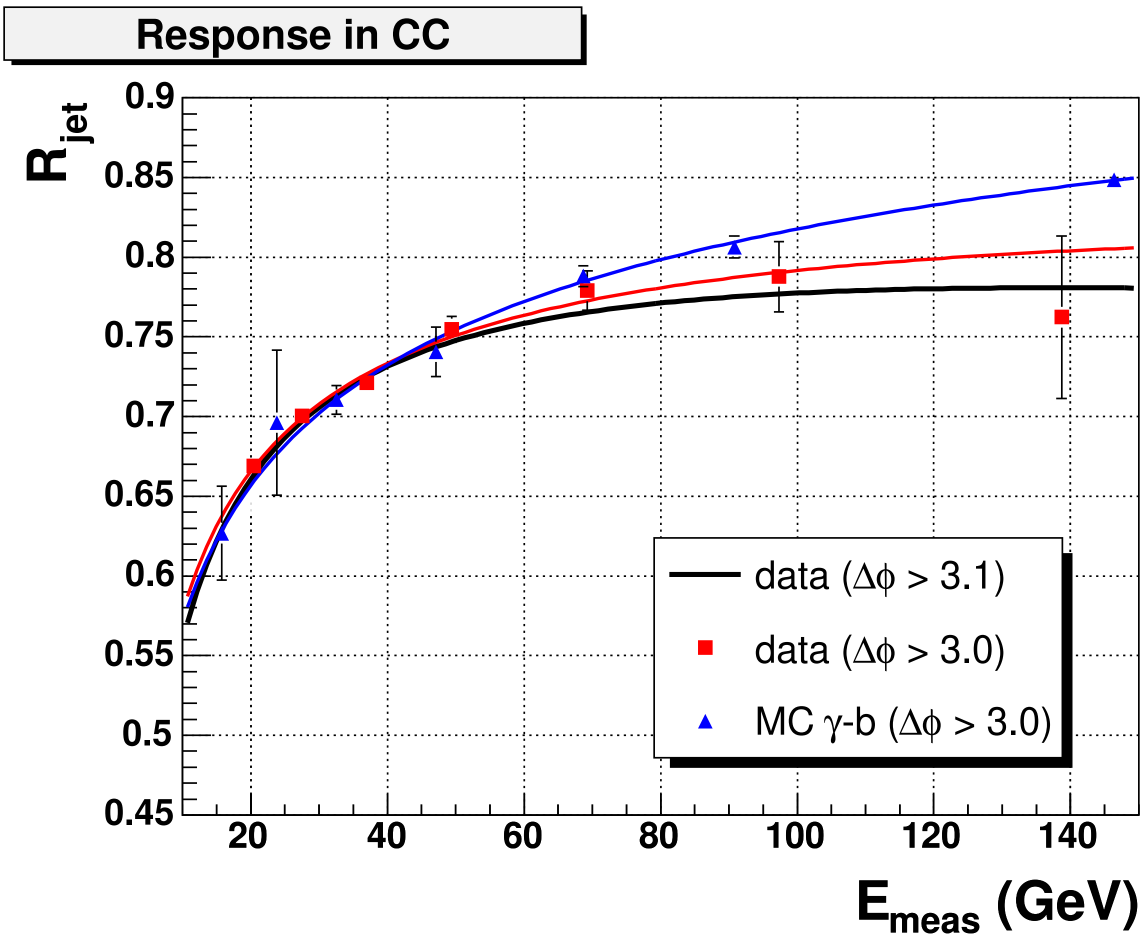
Jet response in the ICD

- Study jet response in the ICD using γ+jet events (Vivian O'Dell) and dijet events (one jet in CC, one in ICD) to test sensitivity on jet p_T (Mikko Voutilainen)
- Better precision expected for next release



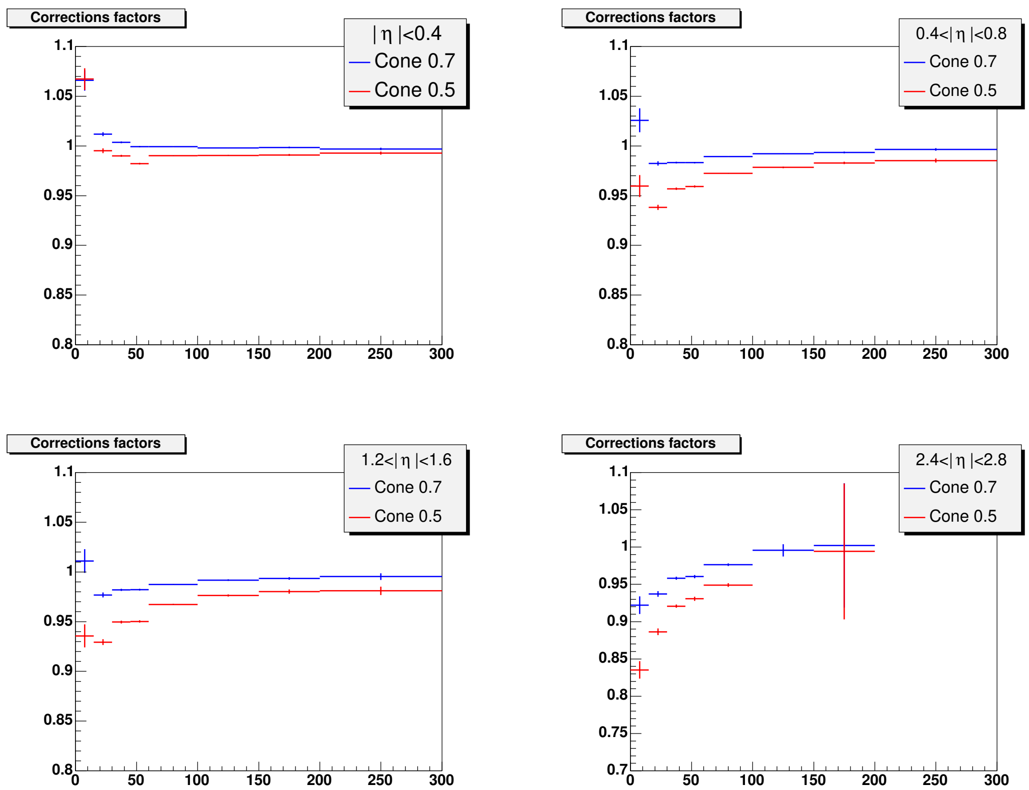
b-jet response

- Use γ+jet events with tagged or untagged samples (Jochen Cammin), new people (Steve Muanza + new post-doc)
- Much progress in this field which will lead to better b-jet JES



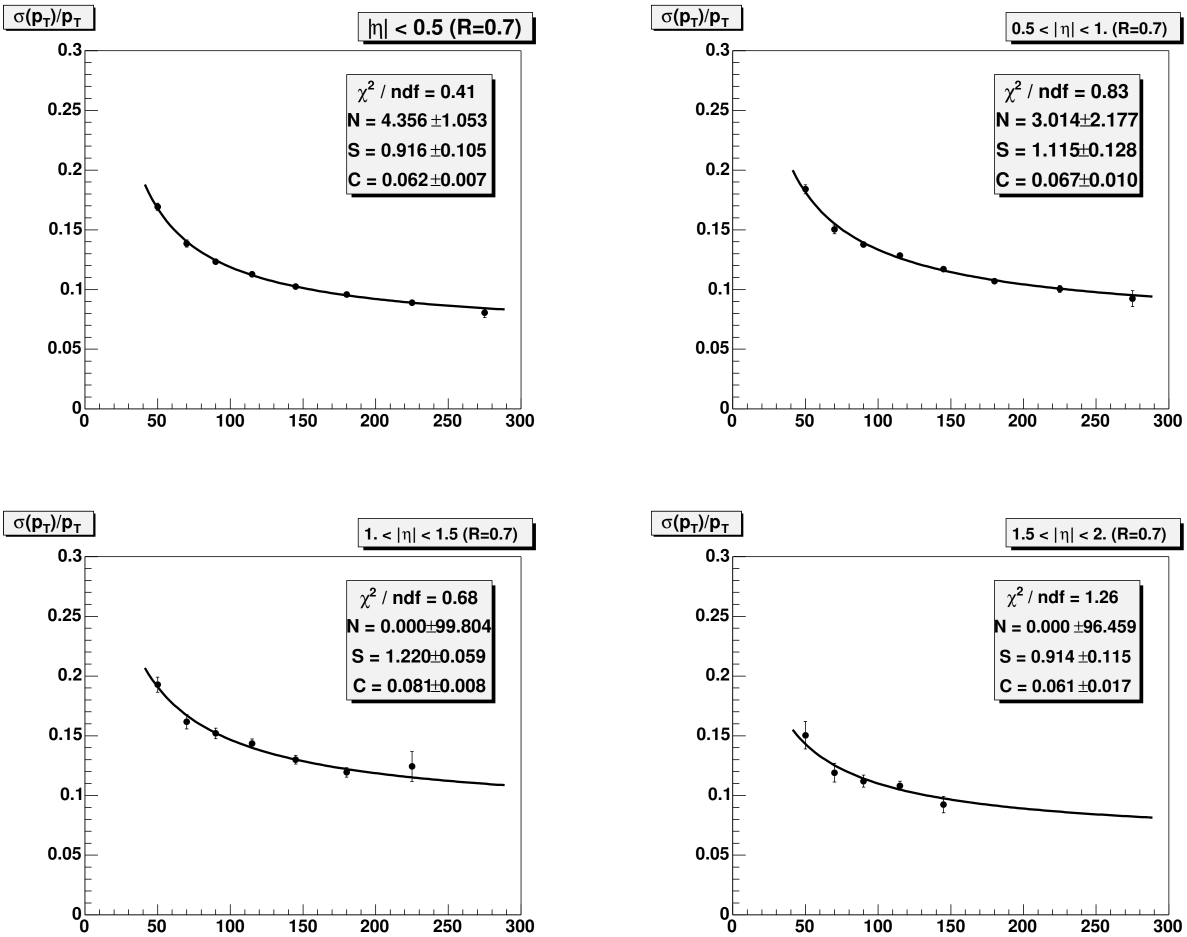
Showering corrections in data

- Out-of-cone showering corrections: much improvement for the latest release of JES (v5.3 done in June), allowed to reduce systematics specially in the central region by about 50% (Jean-Laurent Agram, Christophe Royon):
- to be redone using PASS 2 data, higher statistics at high rapidity (Jeroen Hegeman)



Jet p_T resolution

- Jet resolution using dijet sample: 0.5 cone (Mathieu Agelou), 0.7 cone (Jean-Laurent Agram, Christophe Royon):
- resolution worse than run I: reason still not understood



Other JES activities and people

- JetCorr package: Nirmalya Parua, Ia Iashvili, Christophe Royon
- Comparison of overall corrections between data and MC: Nikola Makovec
- Semileptonic corrections: Kazu Hanagaki
- Response vs jet shape Bob Hirosky
- Showering in MC Markus Wobisch
- MC production Jyothsna Rani
- Closure tests: NN
- Other people, physics groups: people needed in closure tests, showering

Conclusion and timescale

- Preliminary JES for PASS 2 data: beginning of December, not final uncertainties, probably not fully complete (low E_T bias, b-jets
- Final JES for PASS 2 data: mid-March, beginning of April, Full JES including b-jets, tentative to reduce part of systematics
- Long-term studies: Full year 2005, trying to reduce systematics by 50% on JES to be accomplished by December 2005, New people including French students needed
- p17 schedule: preliminary version by end of Summer 2005, final by December 2005