

# INPUT FOR DISCUSSION

# Conclusions I

- FTFP and BERT can be coupled, already now, quite nicely in the range 4-10 GeV
  - Very preliminary scan of transition show no dependence on calorimetric observables on the choice of the transition point (need more statistics and more materials)
- Vladimir showed us that there is a “physics effect” showing something changes in the 3-4 GeV range ...
- BERT could be extended even to higher energies with some efforts (do we need it?)
- Need effort on BIC to allow for coupling with FTF

# Conclusions II

## 📌 Shower shapes:

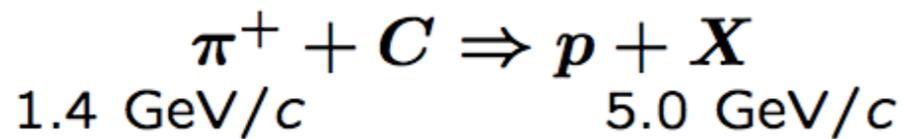
- CALICE data suggests to look at HE models to better describe longitudinal shower shapes. Quasi-elastic , diffraction tuning?
- We should pay attention to description of high-angle cross-sections

📌 We should organize a meeting with CALICE to understand how to use their data

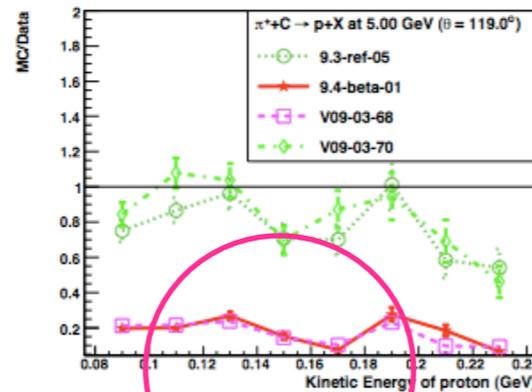
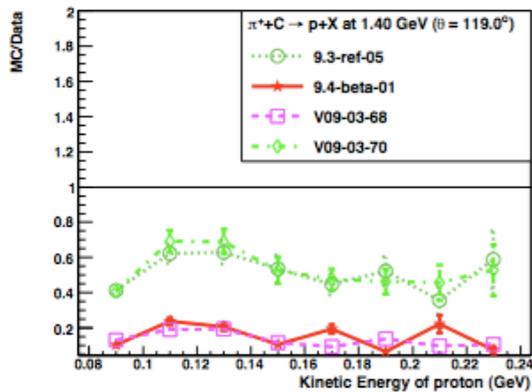
📌 Naively: long. shape HE model Vs later shape LE model. If true we can factorize, but is it true?

# Shower Shapes

- To confirm that BERT (large-angle cross sections) are responsible (at least in part) for shower shapes

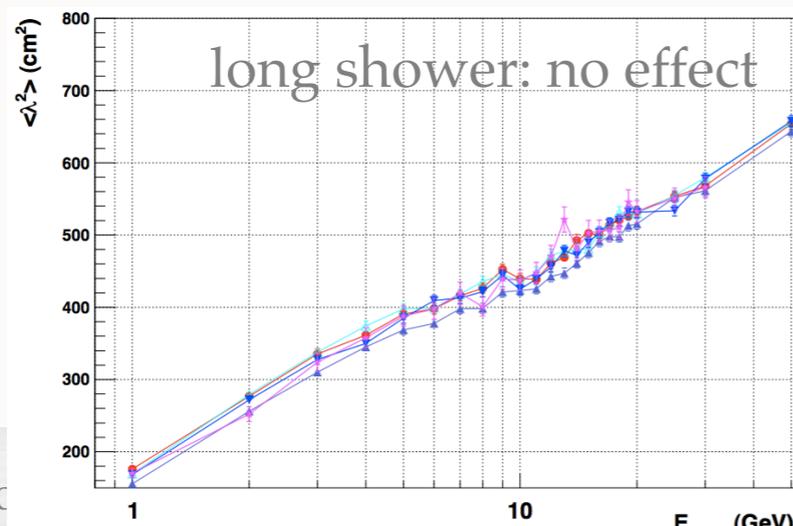


Indication of correlation:  
cross-sec Vs lateral shower shape

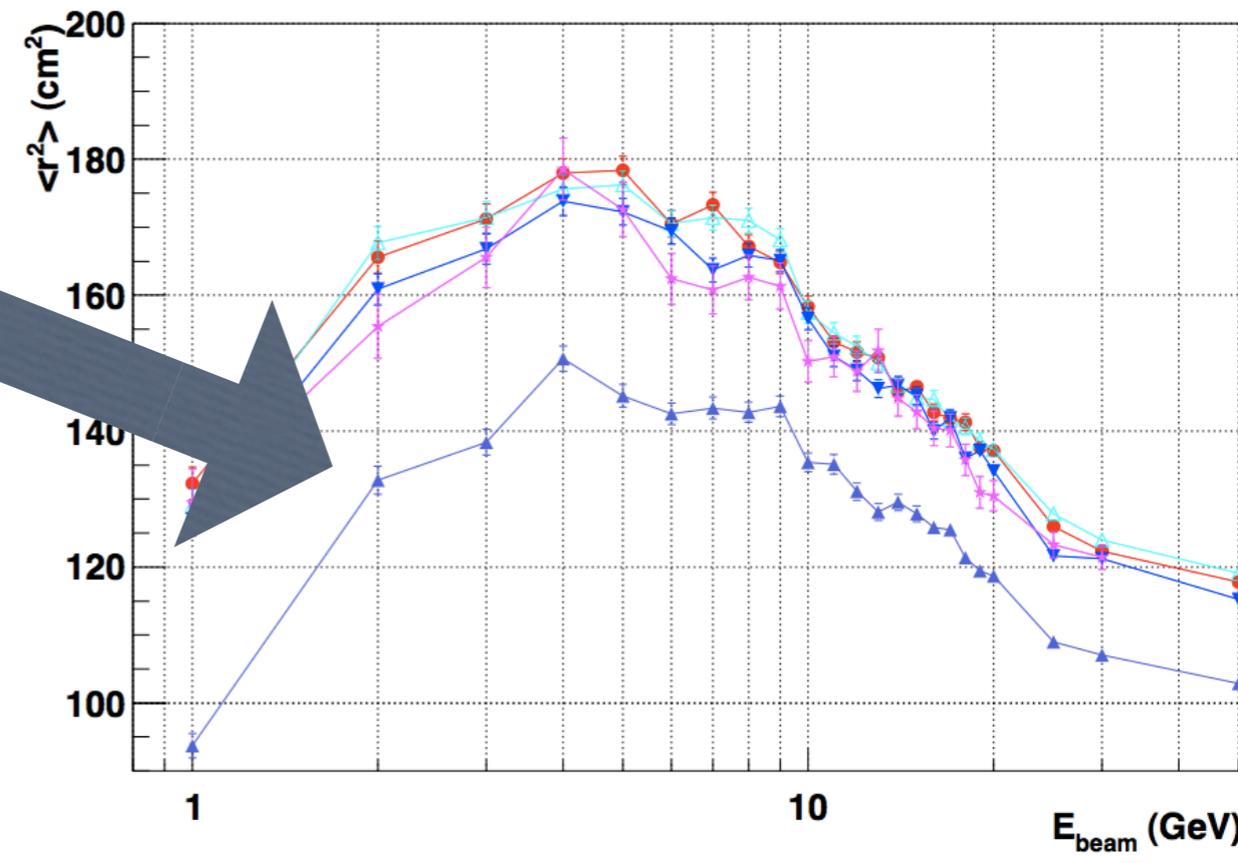


119.0°

green: ref-05 and V09-03-70 **good**    red: 9.4-beta and V09-03-68 **bad**



Lateral shower shape



# Building a PL (based on the experience so far): a working “model”

Search a “point” where two models both agree with data

Thin target data: Tuning-validation

Exclusive channels cross sections  
Compare models (ex: FTF/BERT)

Assemble in PL

Feedback

Change transition “overlap” width around suggested point: effect?

E-scan in Simplified Calorimeters (shower developments)

Compare all observables:  
Response, resolution, shower shape  
Compare with reference G4 versions

Release to experiments

Compare with TB data (CMS, ATLAS, CALICE)

Compare with data

# Simplified Calorimeter

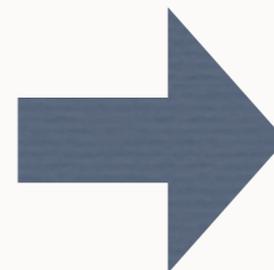
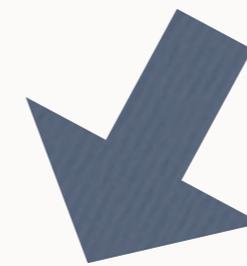
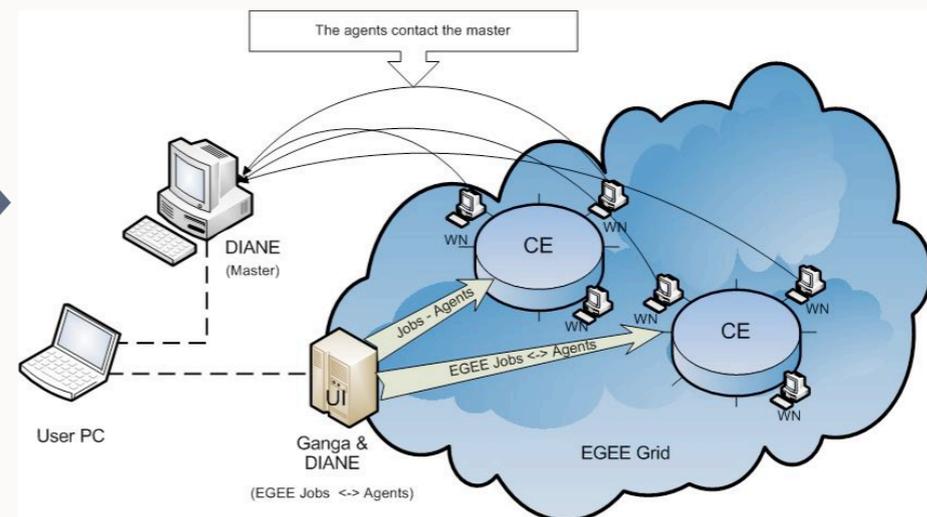
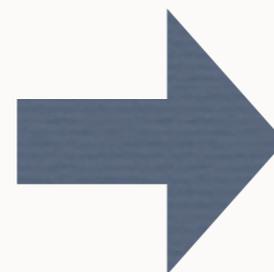
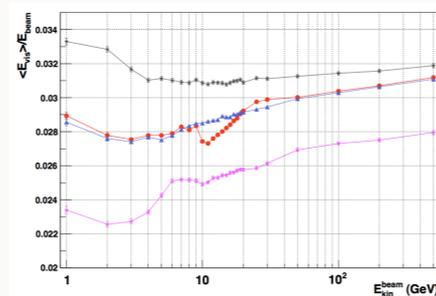
- Currently a G4 application using all simplified calorimeters of LHC is being used routinely

DIANE / GANGA (PYTHON)



Produce data for a G4 version:  
about 10 days (w. 20 workers="cores", would drop to hours using GRID, but need re-work of app)

pyROOT macros



Results DB  
(floats)



ROOT File:  
ntuples / histos

# Proposal

- At the moment Vladimir, Mike and myself are characterizing FTF / BERT in quite details
- Need help for BIC? What is the priority?
- I propose that we consolidate: comparisons with data, software tools (SimplifiedCalo) and produce a report / note in 2011
- What about QGS? Can we re-start working on it to improve it? Is it worth?
  - Maybe would be even good to keep QGSP\_BERT as stable as possible (reference PL for LHC)