

Comments on testbeam setup

- At CERN we can have e/pi beam with well defined energy, fair known composition and fair known intensity.
- Goal of TestBeam exposure: to validate electron reconstruction and energy measurement for opera case.

- We had an exposure of 4 testbeam bricks in Sep.2009: 1,3,3,4GeV.
- Four or five beam bunches had been shot onto each brick (straight+1angle).
- Afterwards no additional cosmic exposure.
- Analyzing the bricks is not yet fully finished.
- First results of the analysis:
 - ...

*Sorry, not enough time to grab the old plots
I made long time ago....*

Prelim Result Statements

- Data Quality is rather good.
 - Scanning smooth.
 - Purity of sample ok.
 - Nor grey or black emulsions.
- Alignment can/must be done with pions from the beam.
 - Bricks were stored horizontally during car/stay, that incoming cosmons are at 90degree to emulsion.

Prelim Result Statements

- Momentum Measurement of pions:
 - Reproducible all 4 momentum mean values.
 - Errors (Gaus/RMS) on p are higher than in the note:
 - Scanning impurities, garbage, emulsion displacement.

Prelim Result Statements

- Energy Measurement of electrons:
 - Bricks have a *relatively* high density of electrons next to each other, the mean distance to another electron is about 600 micron. The standard ConeTube OPERA reco is 800 tube diameter.
 - Overlapping occurs for many showers, i.e. Internal impurities!
 - First estimation: after 10 plates, *about* 30% overlap (in simulation)
 - Solution methods: tighten reco cut criteria.
 - Appropriate for TB data, Inapropriate for Opera events, large loss of shower collection efficiency!

Recommendations for a new TB setup.

- The TB has to reflect the standard Opera case as close as possible:
 - Take full Brick, including CS; put in in beamline same way as in Opera (i.e. CS at end of the beam).
 - Avoid shower overlaps, i.e. reduce number of beam bunches. It is better to scan larger areas for longer time, than instead introducing new systematic biases.
 - Use the average electron incoming angle rather than straight electrons.
 - For ν_e and tau case focus on more energetic values (not 1GeV).