OPERA Electron Working Group Meeting
march30th2010
A.Zghiche

OpRelease-OpEmuRec-sysal

Analysis chain qualification with MC simulation

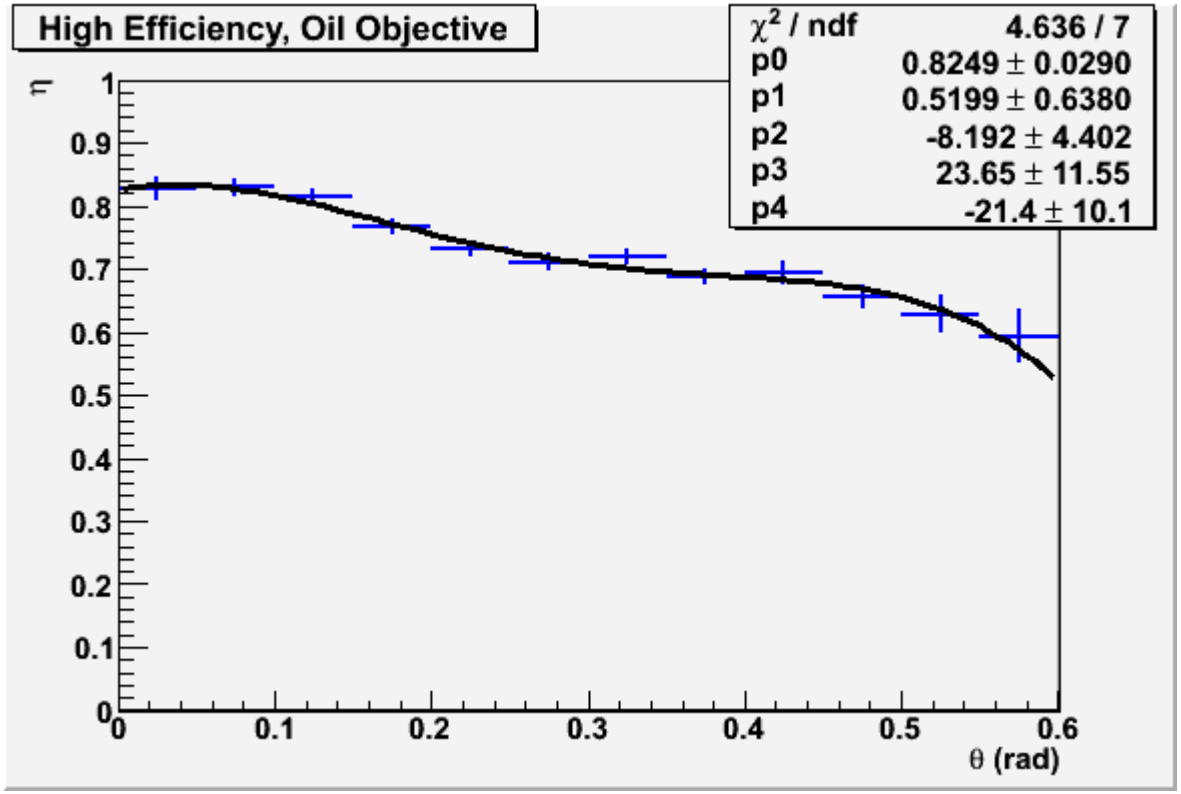
Using OpRelease-OpEmuRec-Sysal

- **News from last time on the analysis chain**
- **Qualify the analysis chain using the Simulation of muons of different energies and angles to understand the measured efficiencies (with cosmic data)-some warnings**
- **Particle Identification: another example**
- **Shower reconstruction**

Analysis Chain: news from last meeting

- Running on ccalisl4: /sps/opera/scratch/zghiche/analysis/
- **OpRelease/3.2**
  - OpSim: bugged yet, many options are not operationnal. Used Brick-Map-Front
  - OpDigit: should tune the parameters of file: Defaults.par (all files produced in ccali have been with an efficiency different from 1.
- **OpEmuIo**: now Ok for multi event files…
- **OpEmuRec:** ongoing work on shower reconstruction implementation

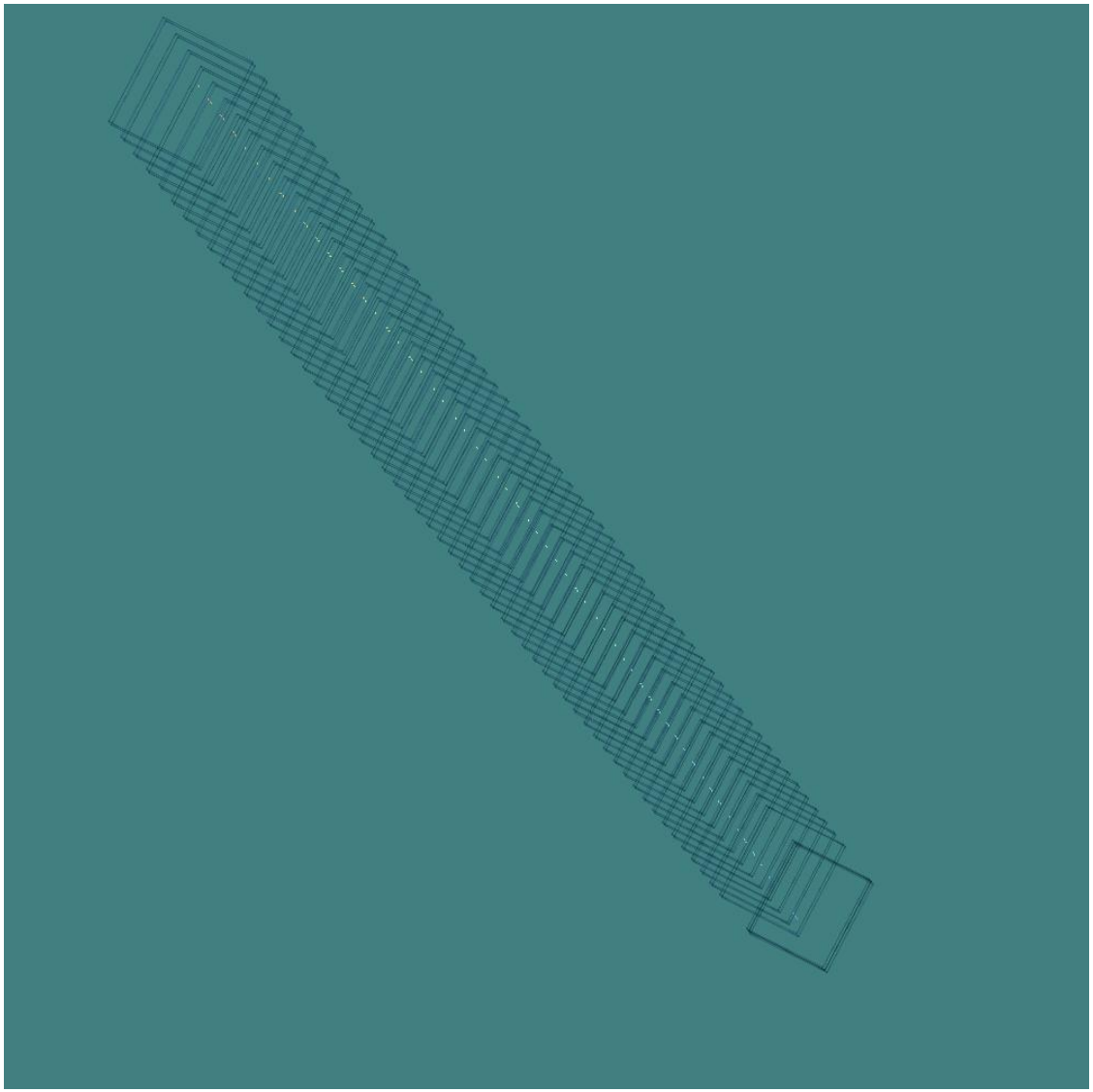
Base track efficiency with Fedra (M. Guler)



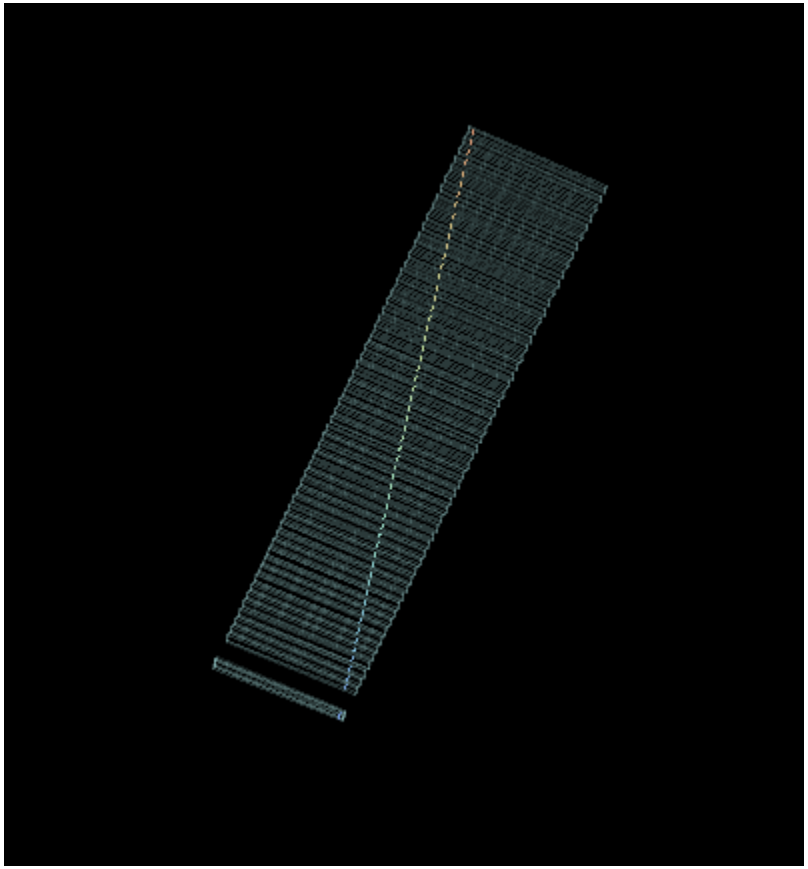
Qualifiying the analysis chain: MC Efficiency with Sysal environment

- The efficiency computed here is the microtrack efficiency using the length of the reconstructed track against the number of microtracks in it.
- Started with muons of 2-10 GeV and 0-500mrd
- Worked with the energy and angular distributions from the cosmic pit to reproduce the data efficiencies (official plots from Fedra and Sysal-ref Murat)
- Outlook using data background and simulated events with Genima

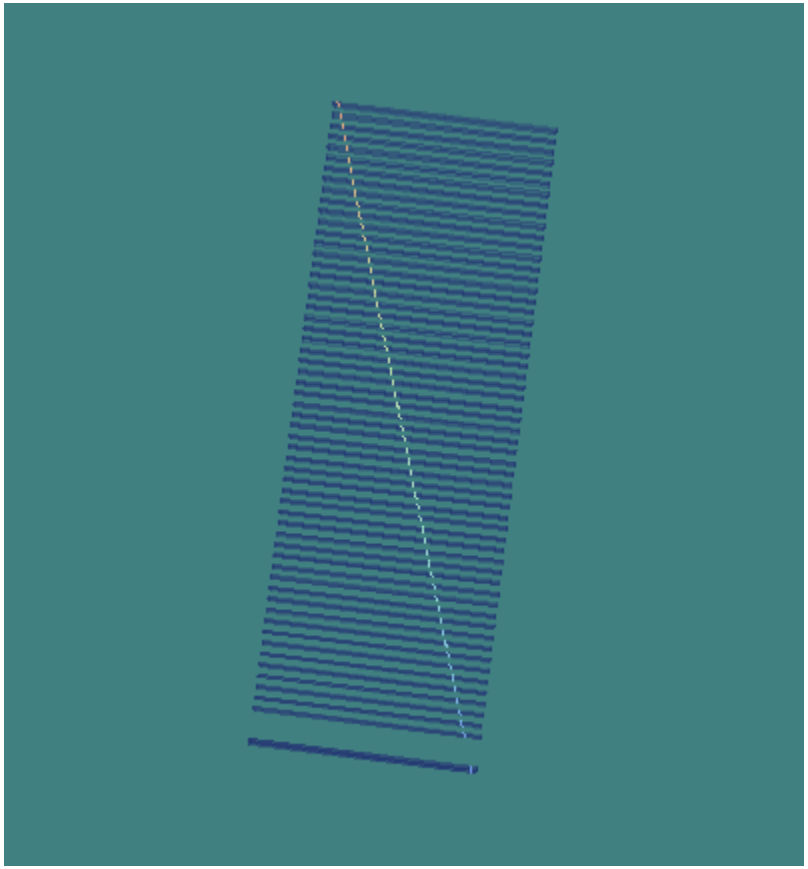
Muon-Front-10GeV-0mrd



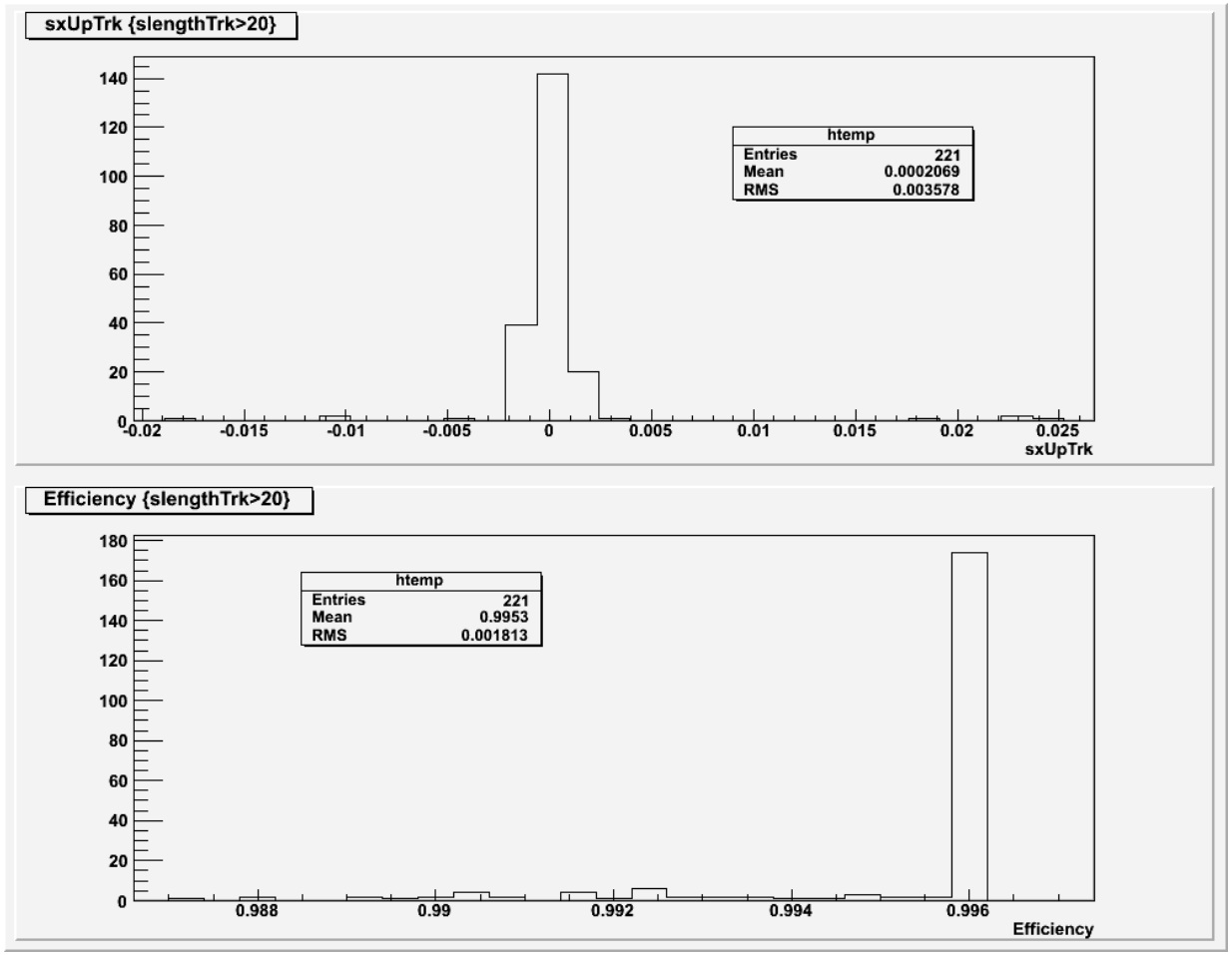
Muon-Front-10GeV-100mrd



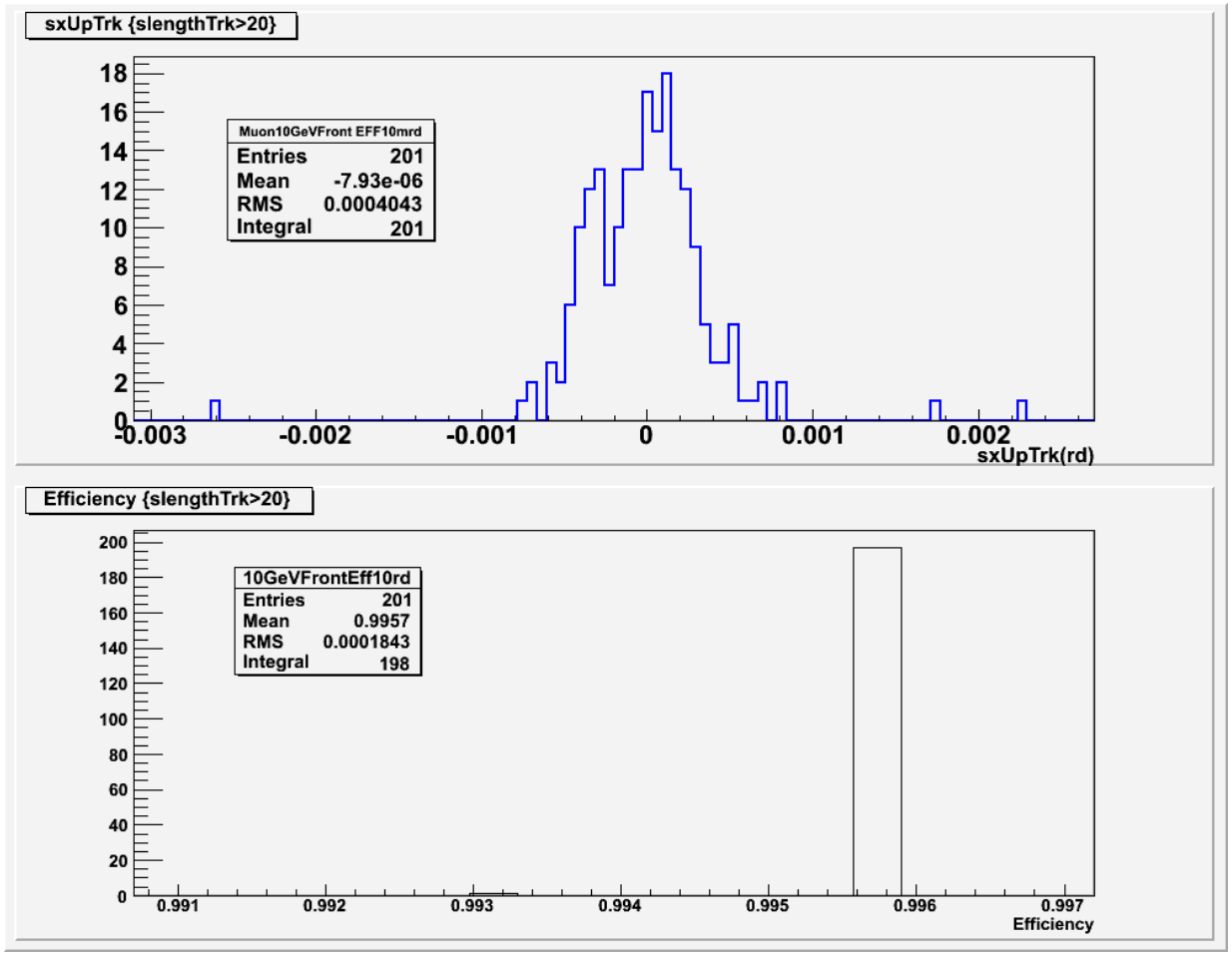
Front-10GeV-300mrd



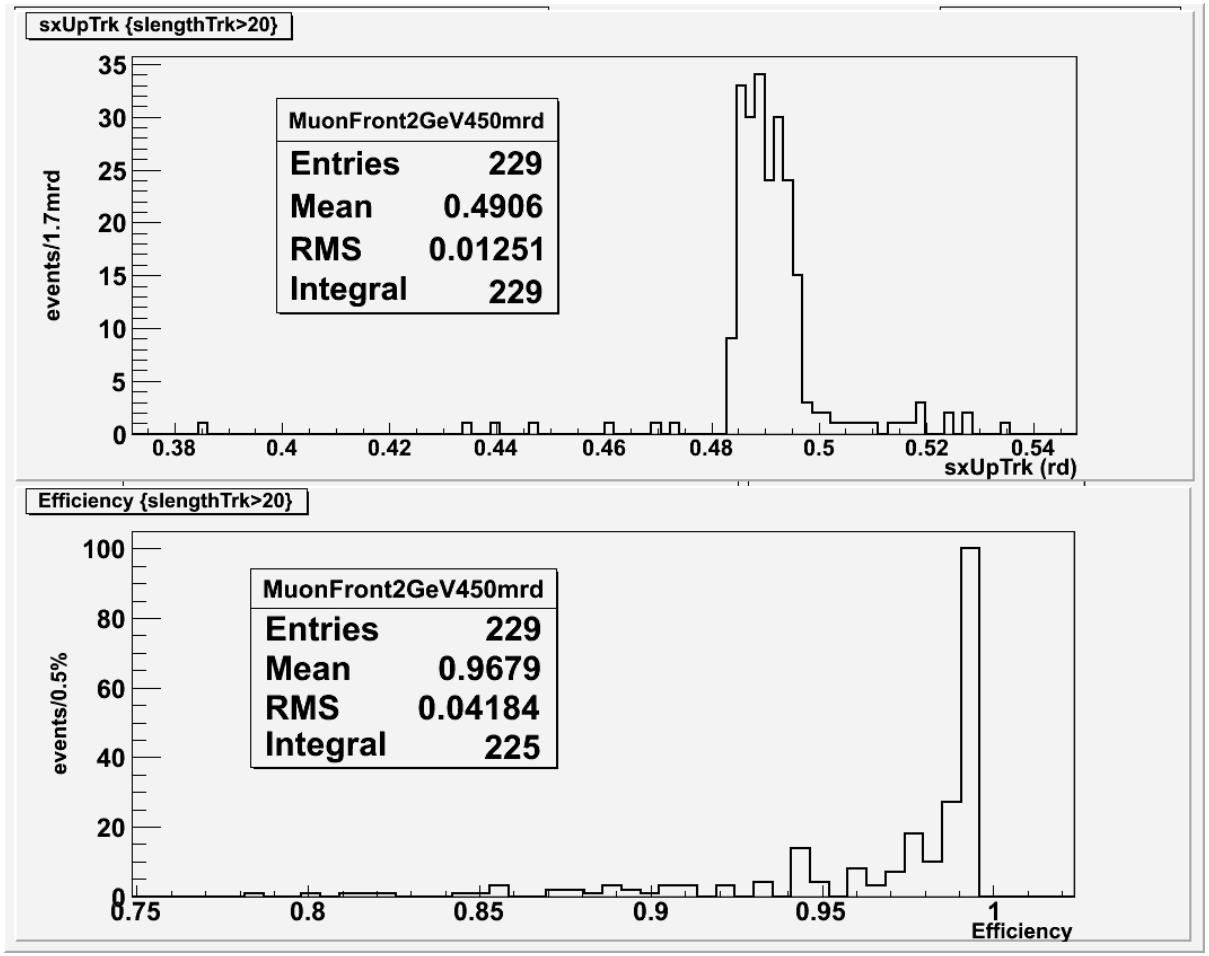
2gev 0mrd front muon eff1



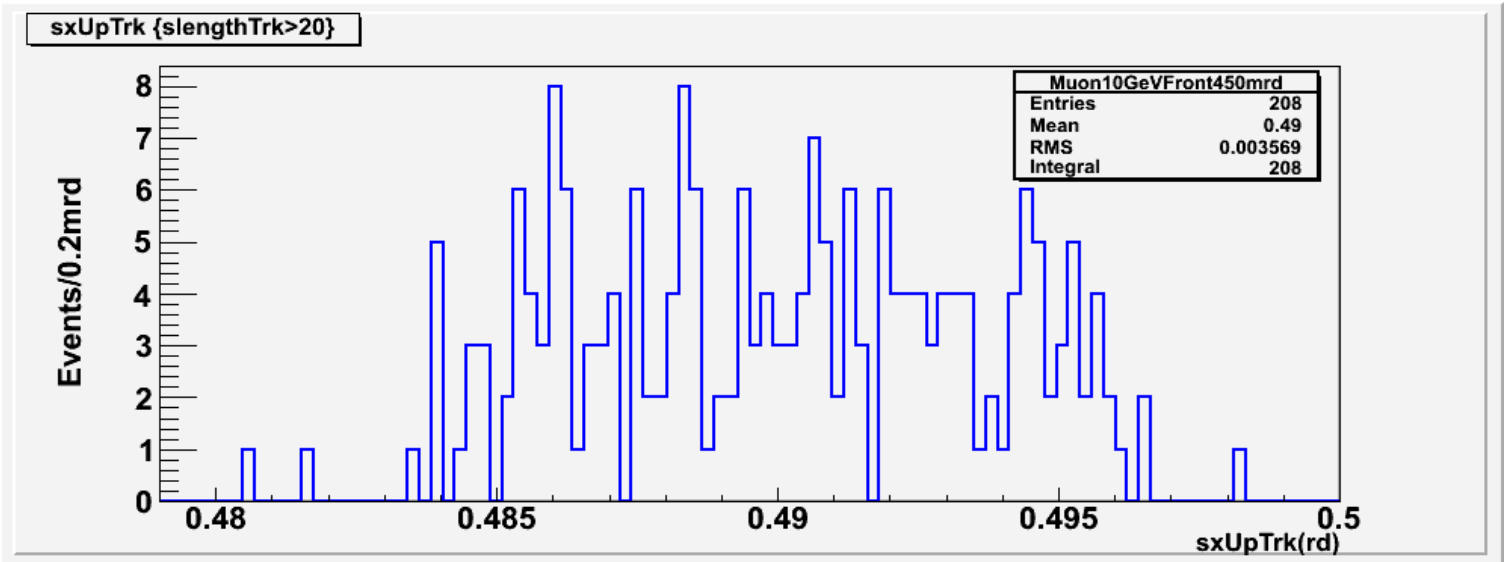
10GeV 0mrd front muon eff1

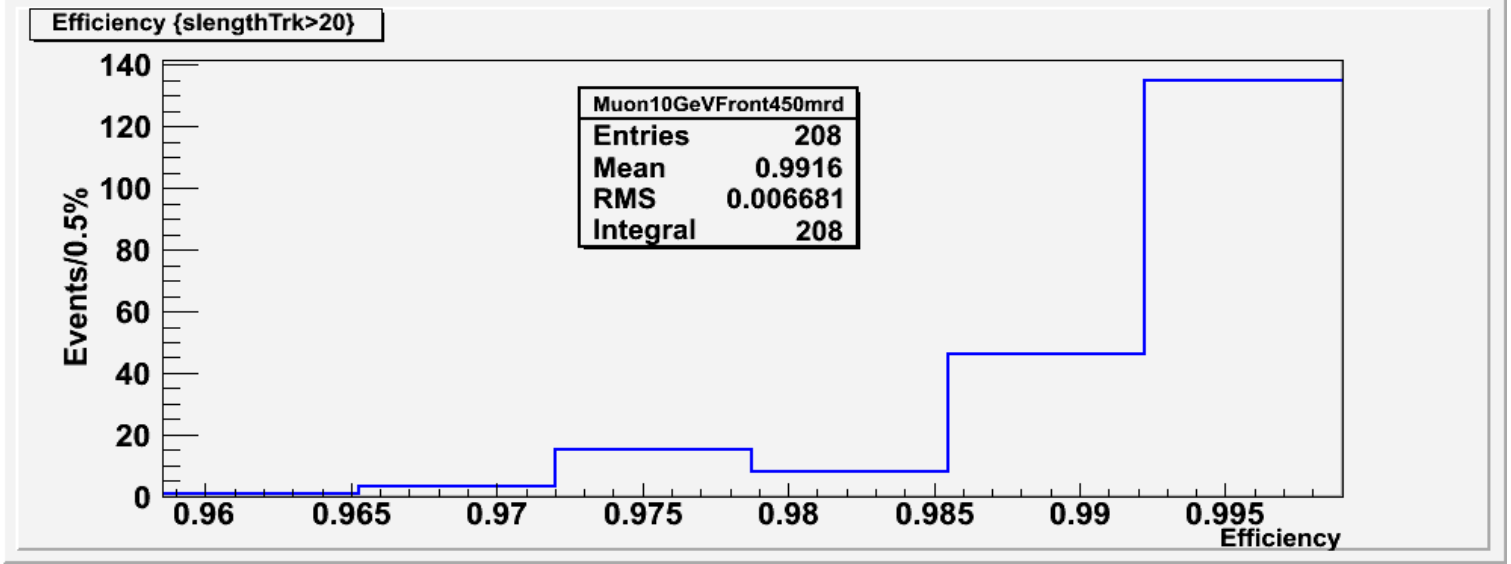


Muon Front EFF1 -2GeV 450mrd efficiency

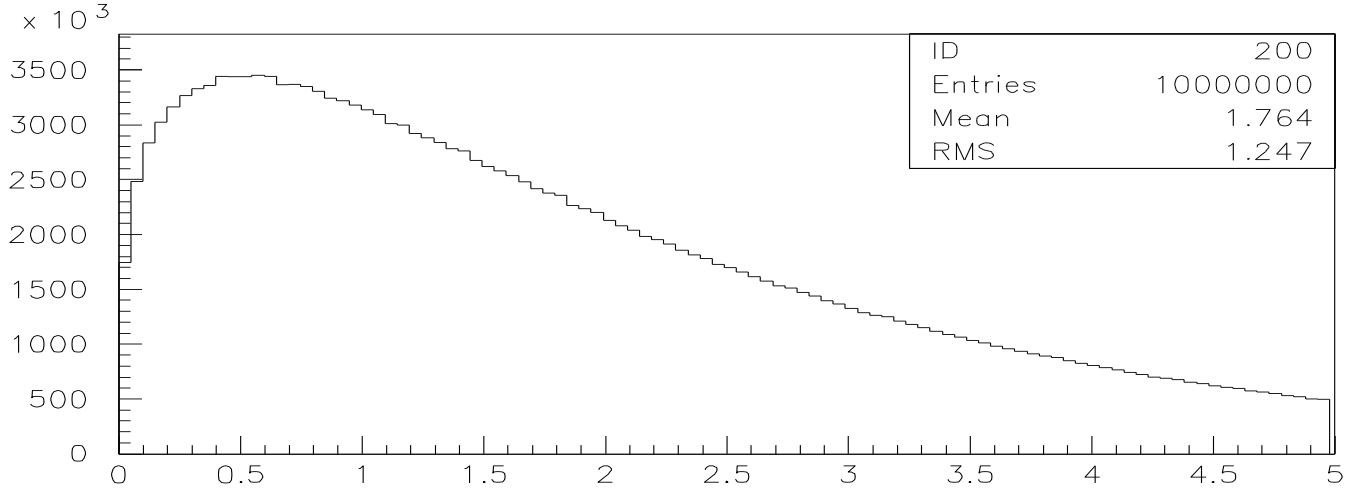


Muon Front EFF1 -10GeV 450mrd efficiency

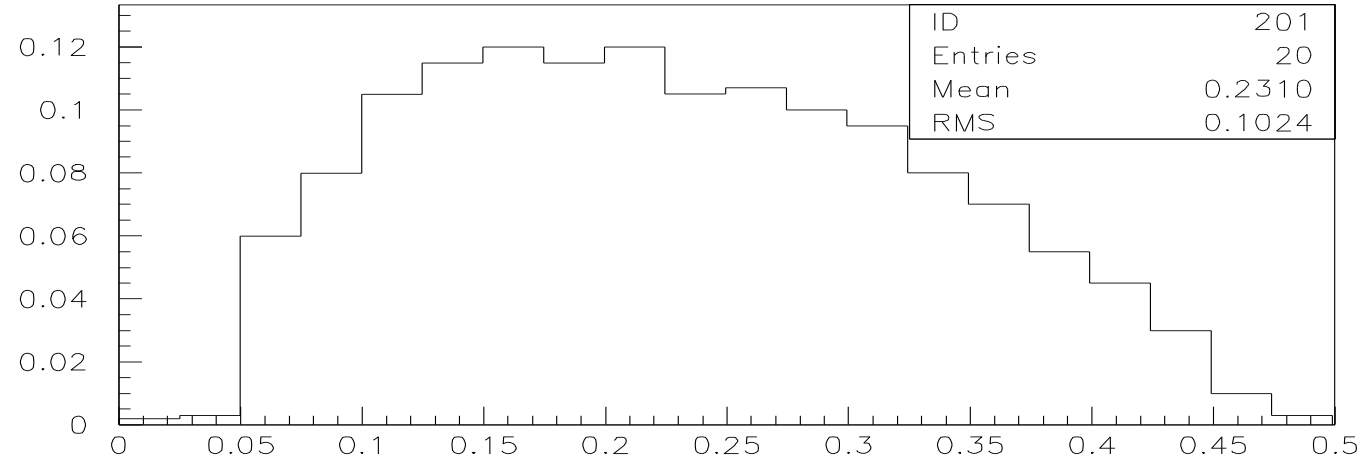




Energy and angle profiles in the Cosmic pit (cosmic paper and J.Favier)

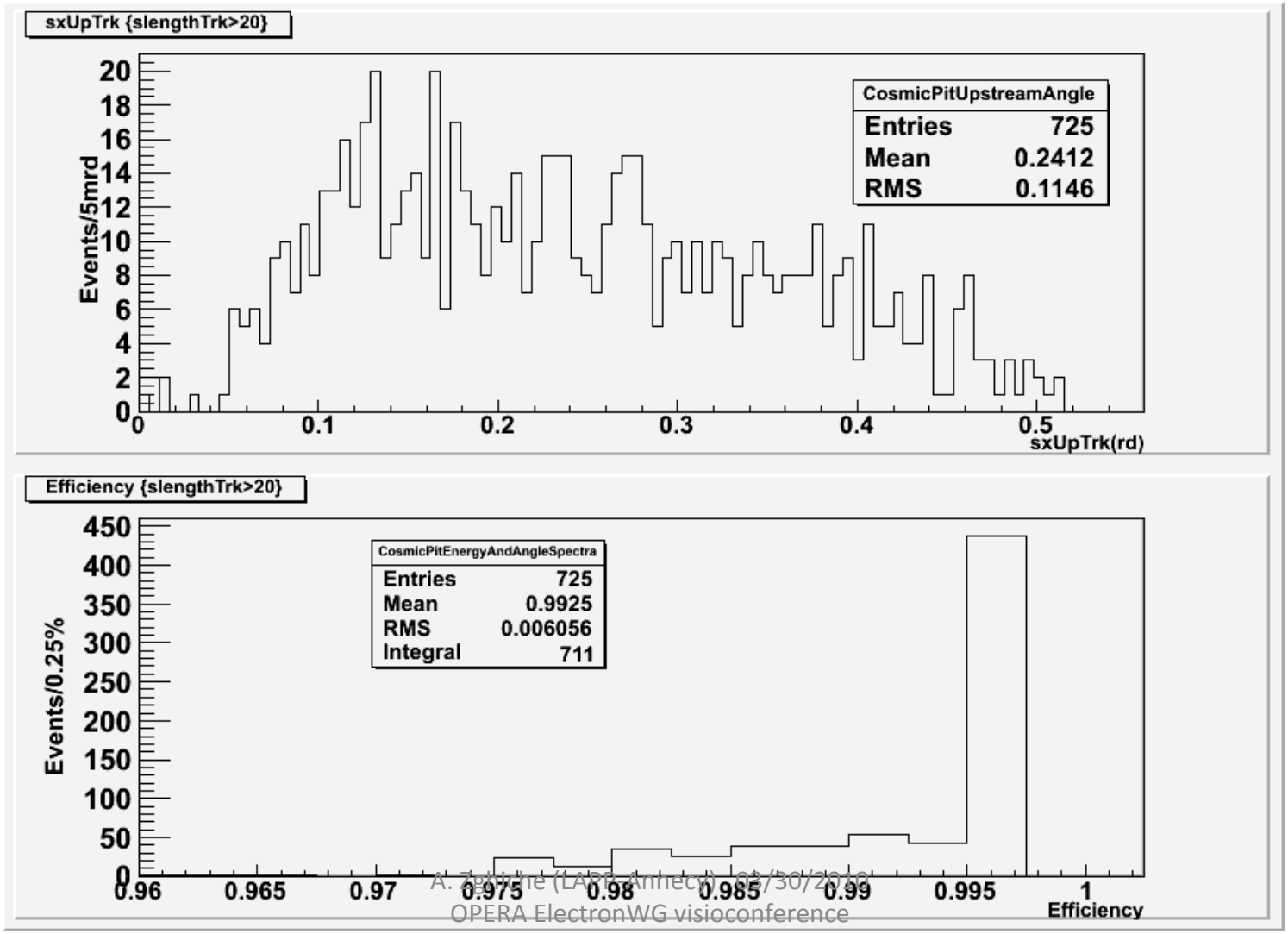


spectre pit



agle pit acc

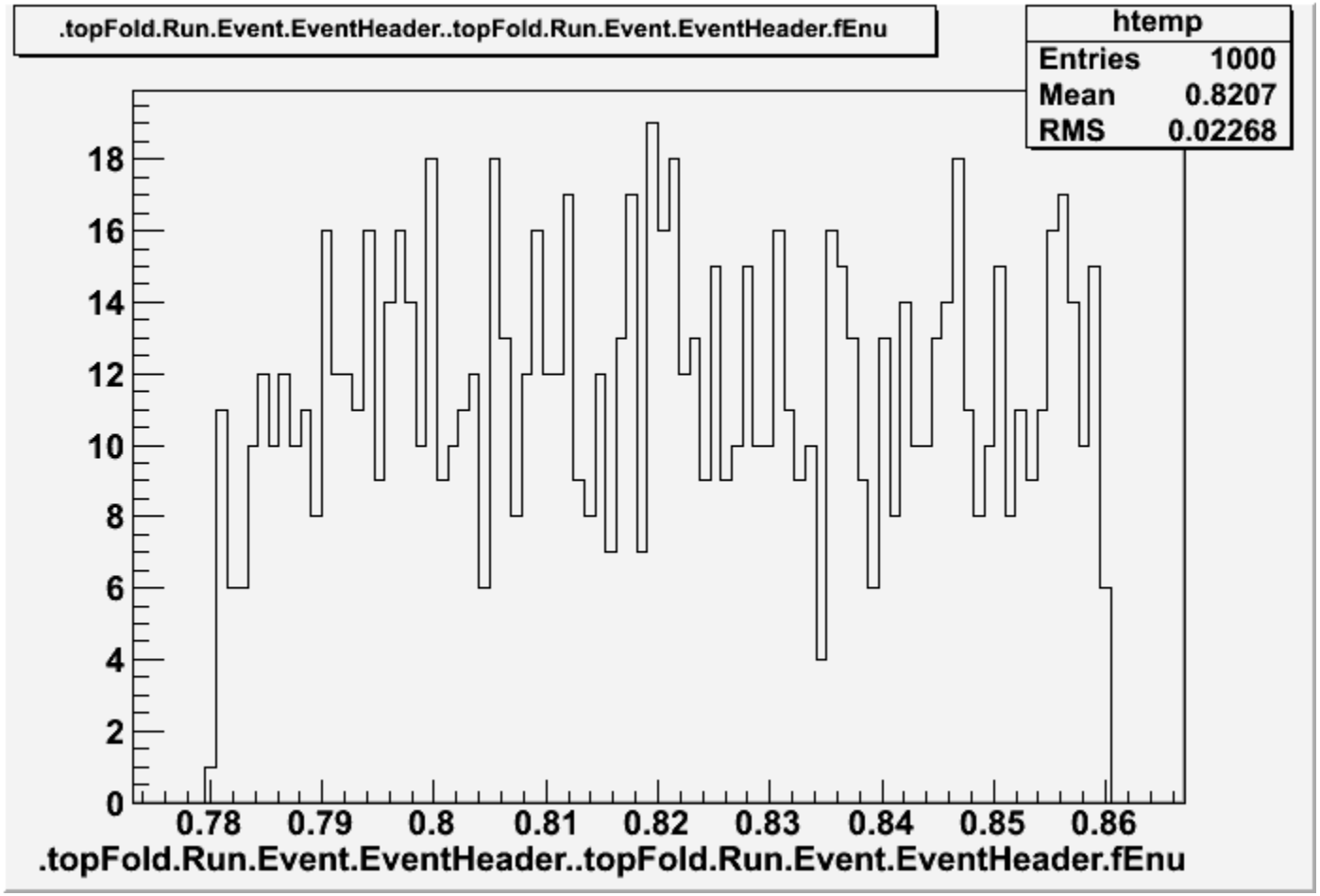
Muon Front EFF1 –cosmic pit random efficiency



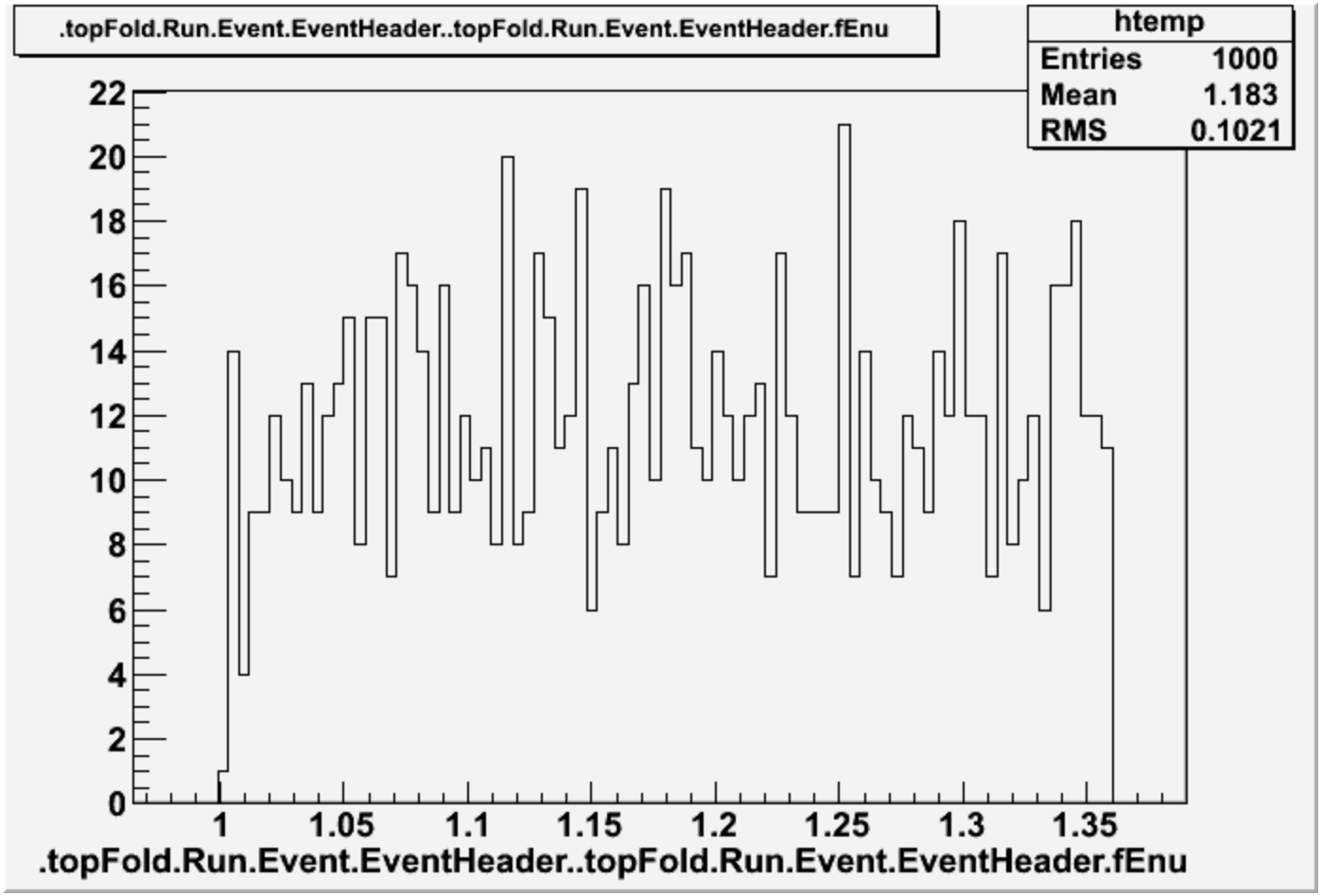
Another Example: Particle Id

- The example of the track 4 of the famous candidate: kaon of proton?
- Need to compute the the total grain number for each track as well as the range of each…
- Generated protons of 1.2 +-15% and kaons of 0.8GeV+-15%
- In progress…some plots…

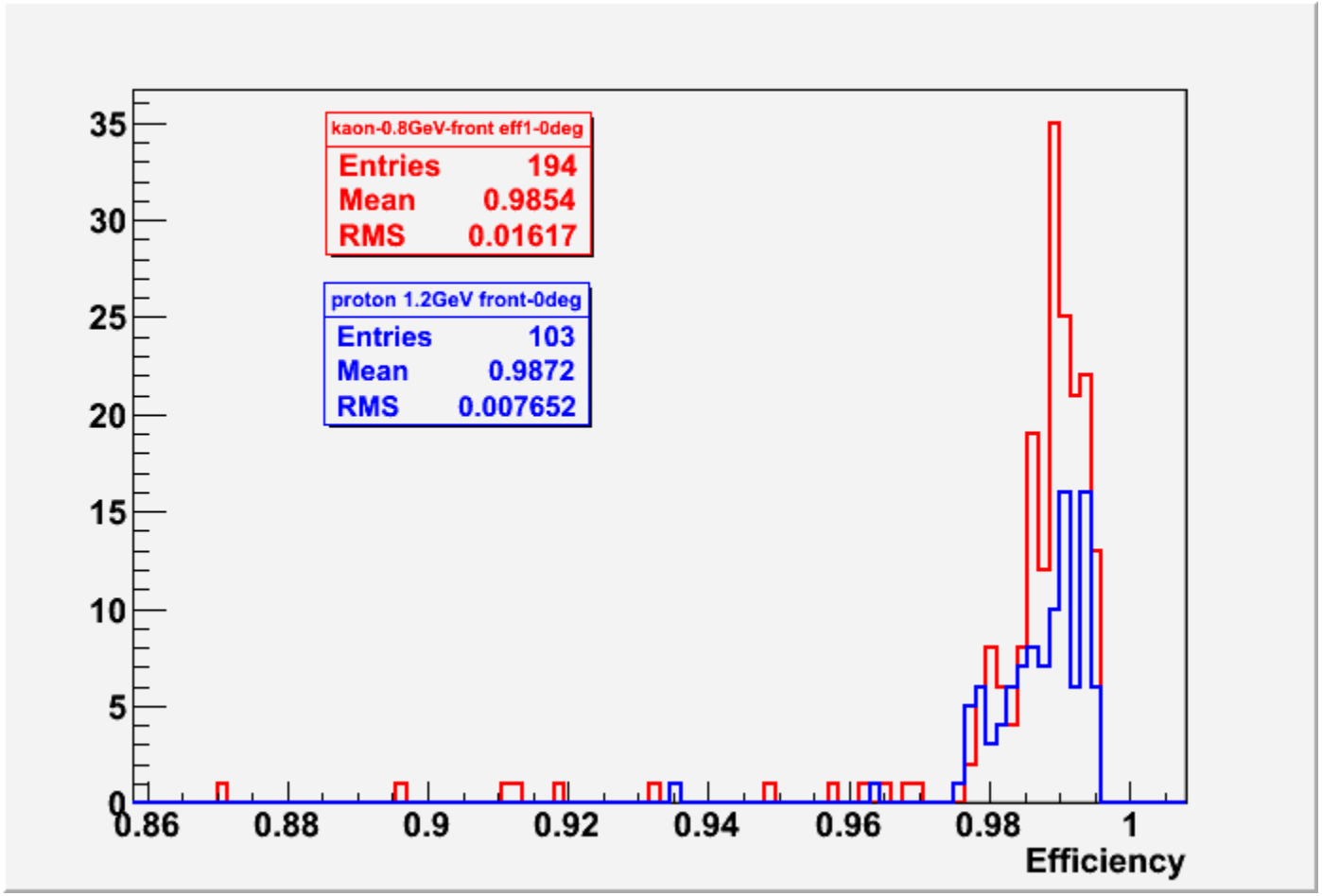
Kaon energy distribution



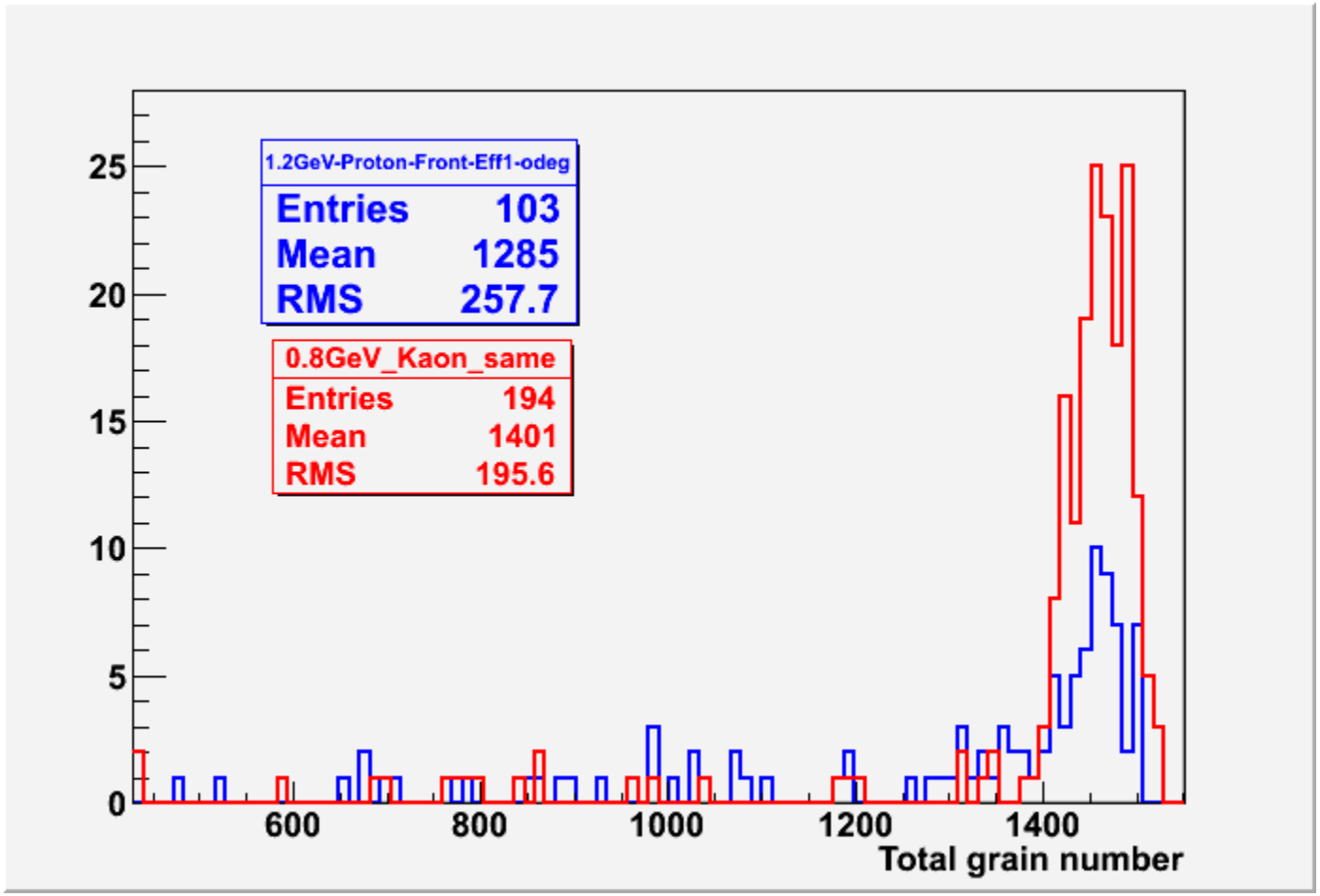
Proton energy distribution



Kaon and proton Efficiency



Total grain number for protons and kaons



outlook

- **Efficiency**: Add background to compute the real efficiency
  - Awaiting the next release of OpEmuIO to include background
  - Not only, generating events with background using Genima, going through the whole chain and study the efficiency for different angles and energies…
- **Particle Id**: Everything still to be done!
- **Shower reconstruction in OpEmuRec**: first priority!
- Status of data: same as in january(~80 events) …