Calice TCMT beam test Status Report

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The CALICE TCMT prototype

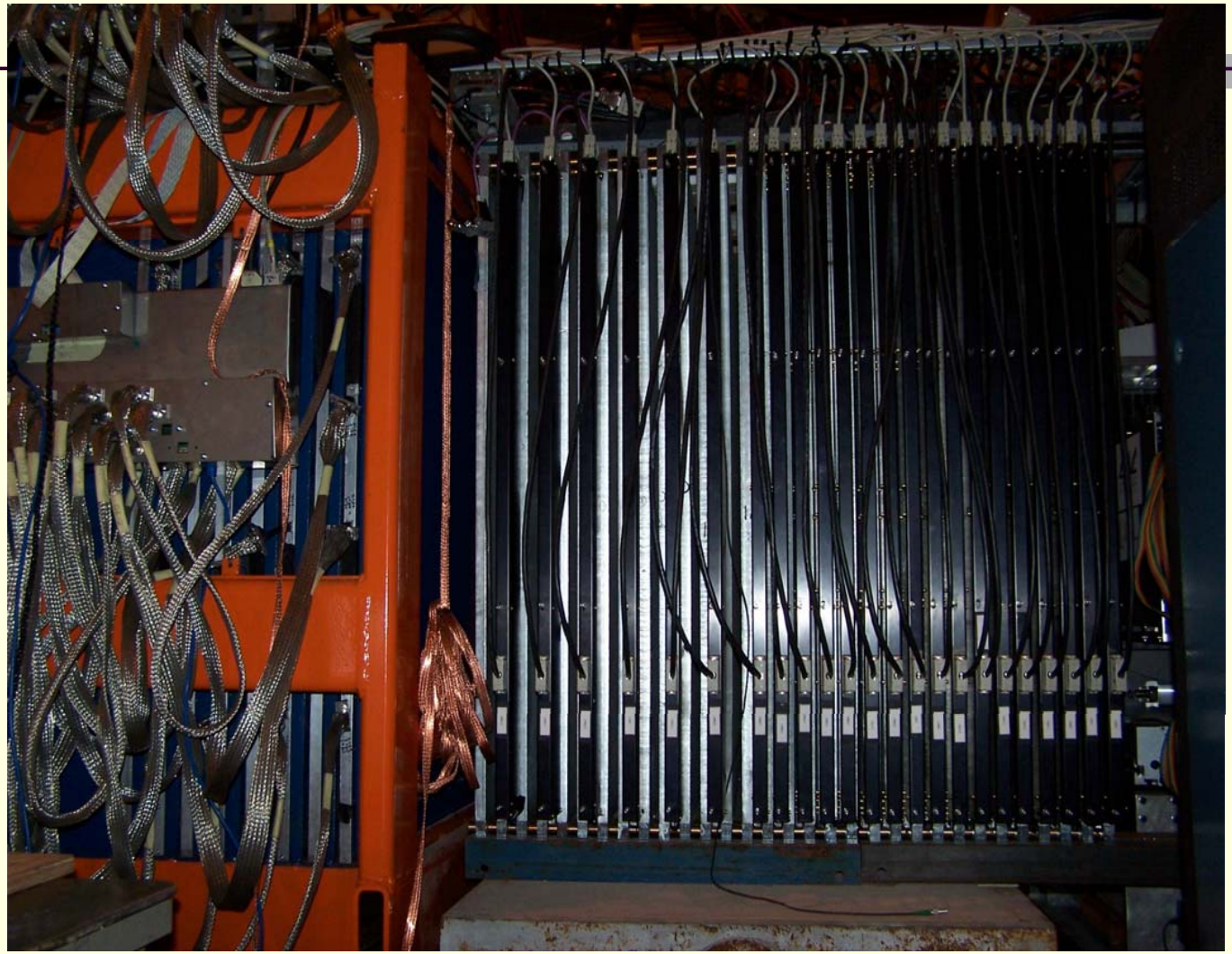
All 16 layers fully instrumented
(8 fine + 8 coarse)

Alternate x,y orientations

Fine section (~ 2cm absorber)
Coarse section (~ 10cm absorber)

20 channels (strips) / cassette
Each strip is 100 × 5 × 0.5 cm^3,

The CALICE TCMT prototype

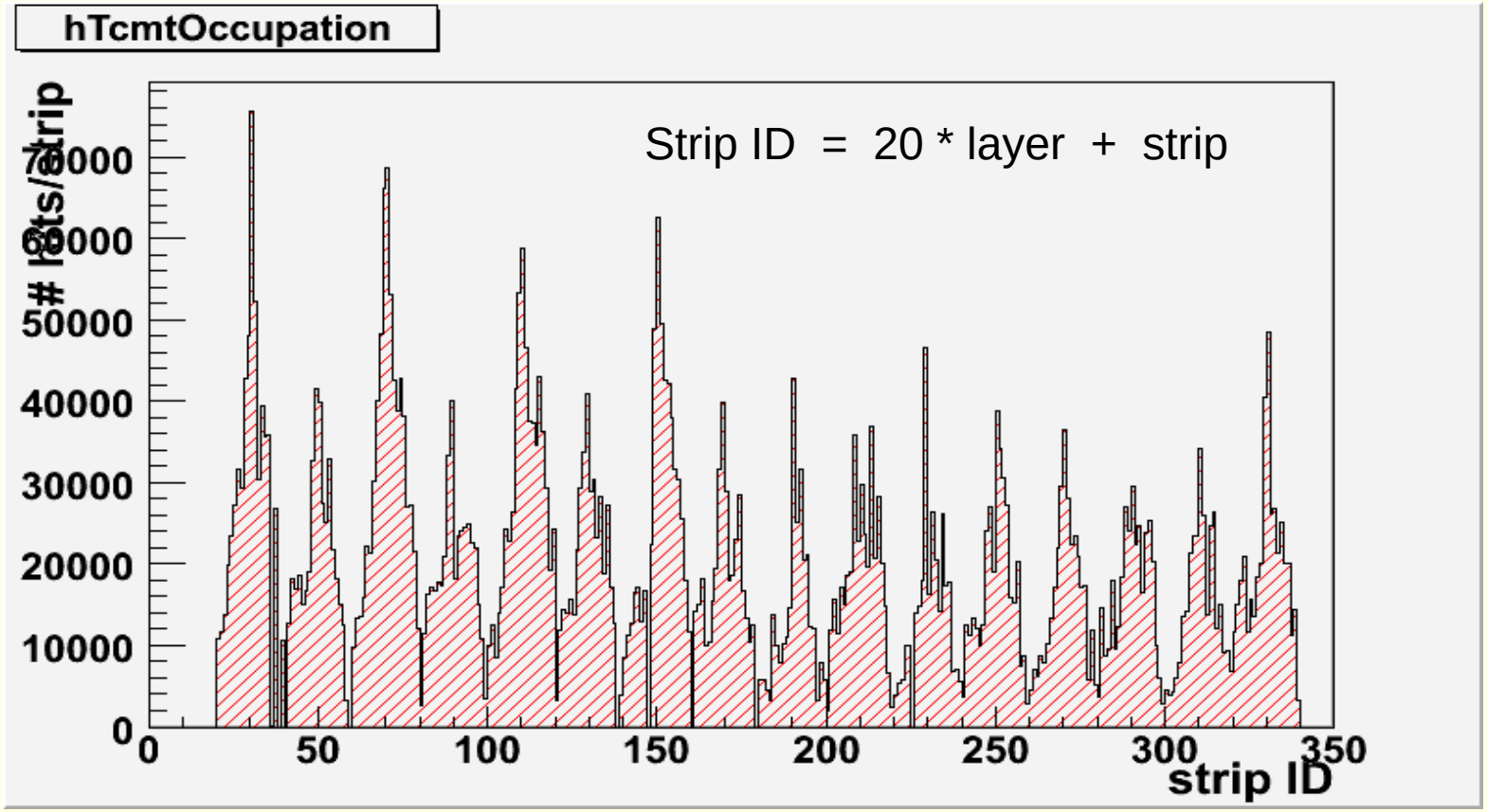


TCMT **HCAL**

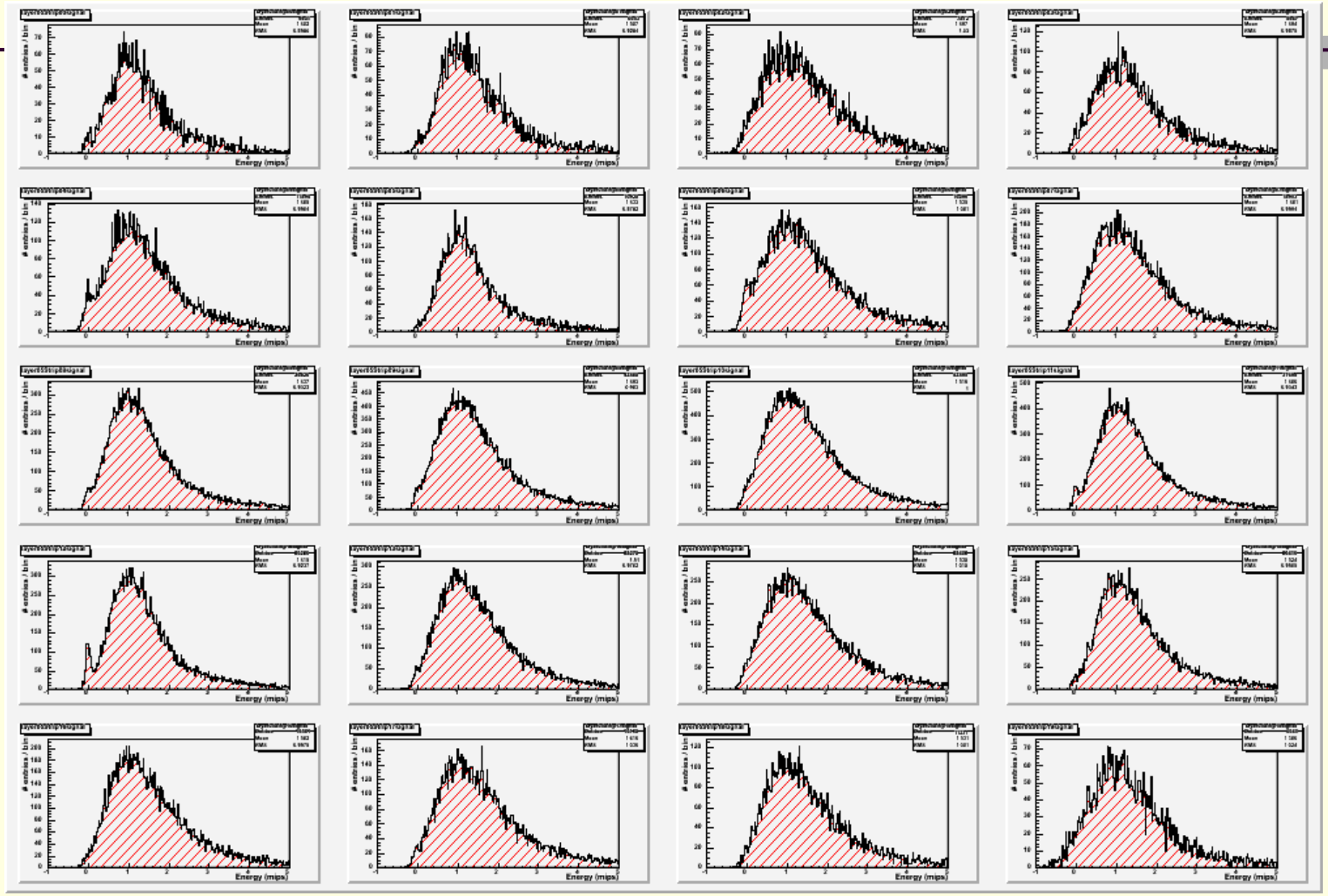
First Look at Data

- Basic sanity checks
- Tuning hit selection requirements:
  Ehit > 0.5 Emip and Ehit > 2sigma(pedestal)
- Calibration:
  - MIP: Using muon samples
  - calibrated hit energies in terms of Emip
- Preliminary looked at some pion samples (30 and 80 GeV)

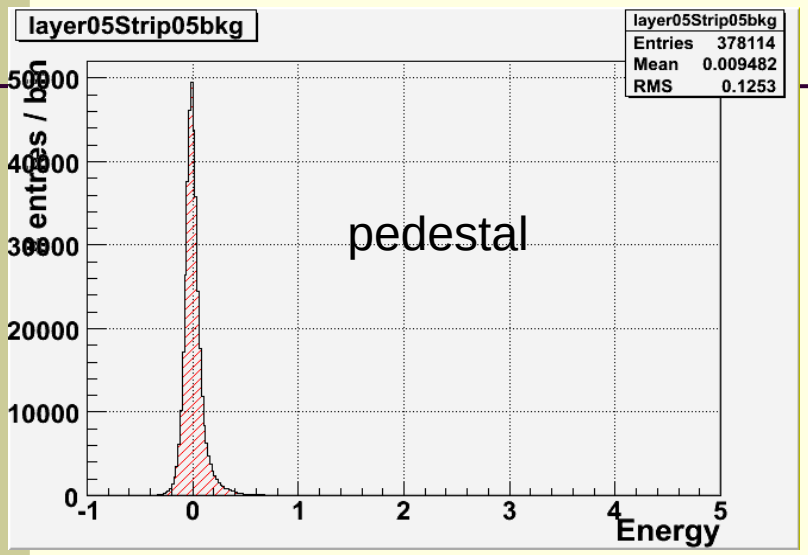
Muon run: occupation and beam profile

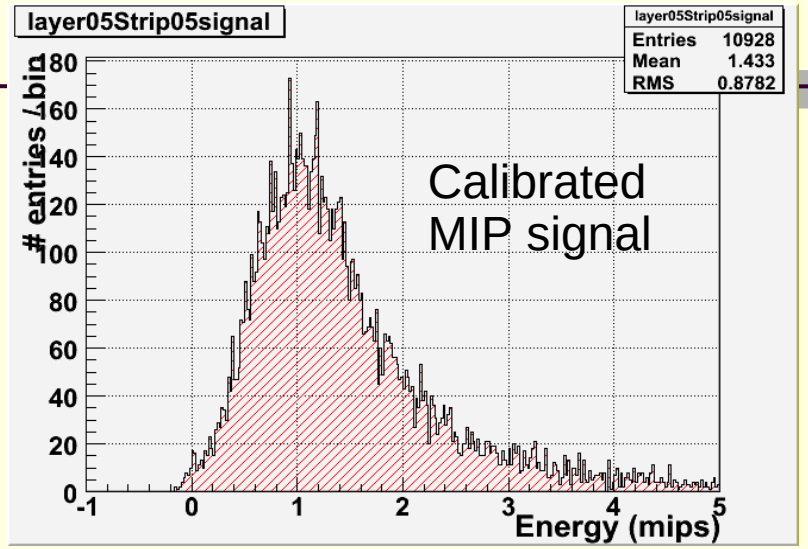


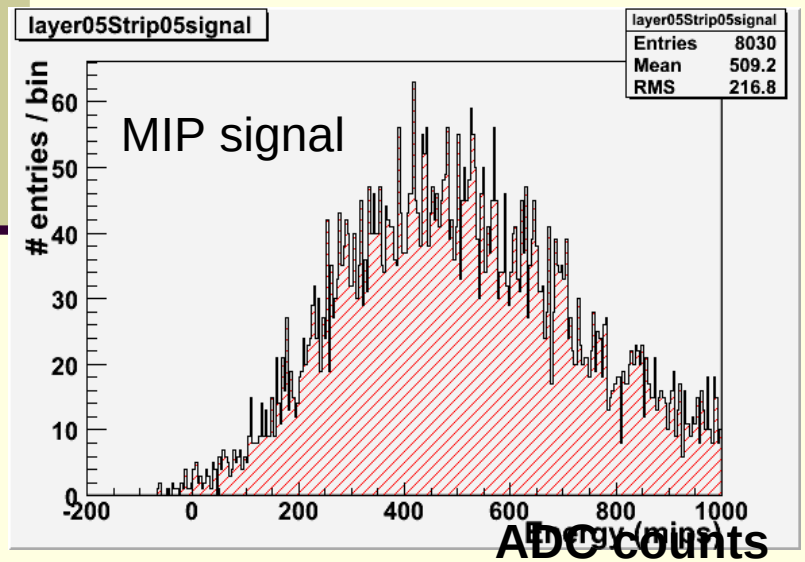
Layer 5: mips on each channel

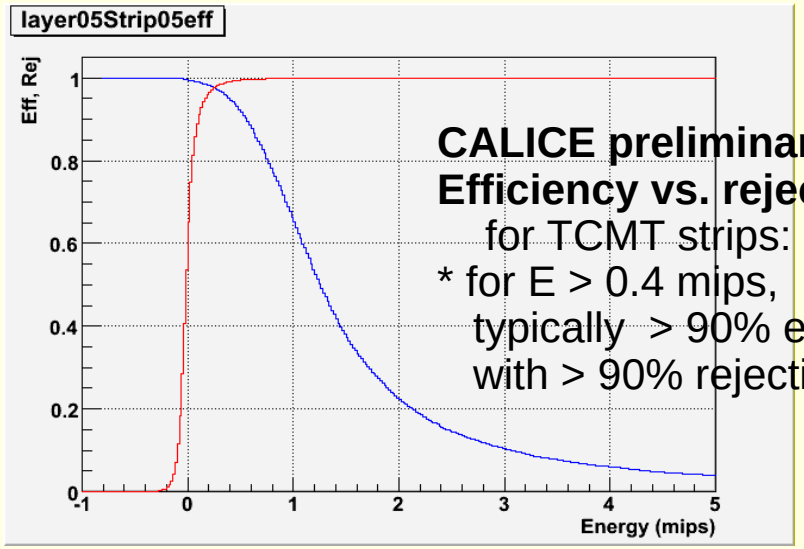


A closer look into a TCMT strip







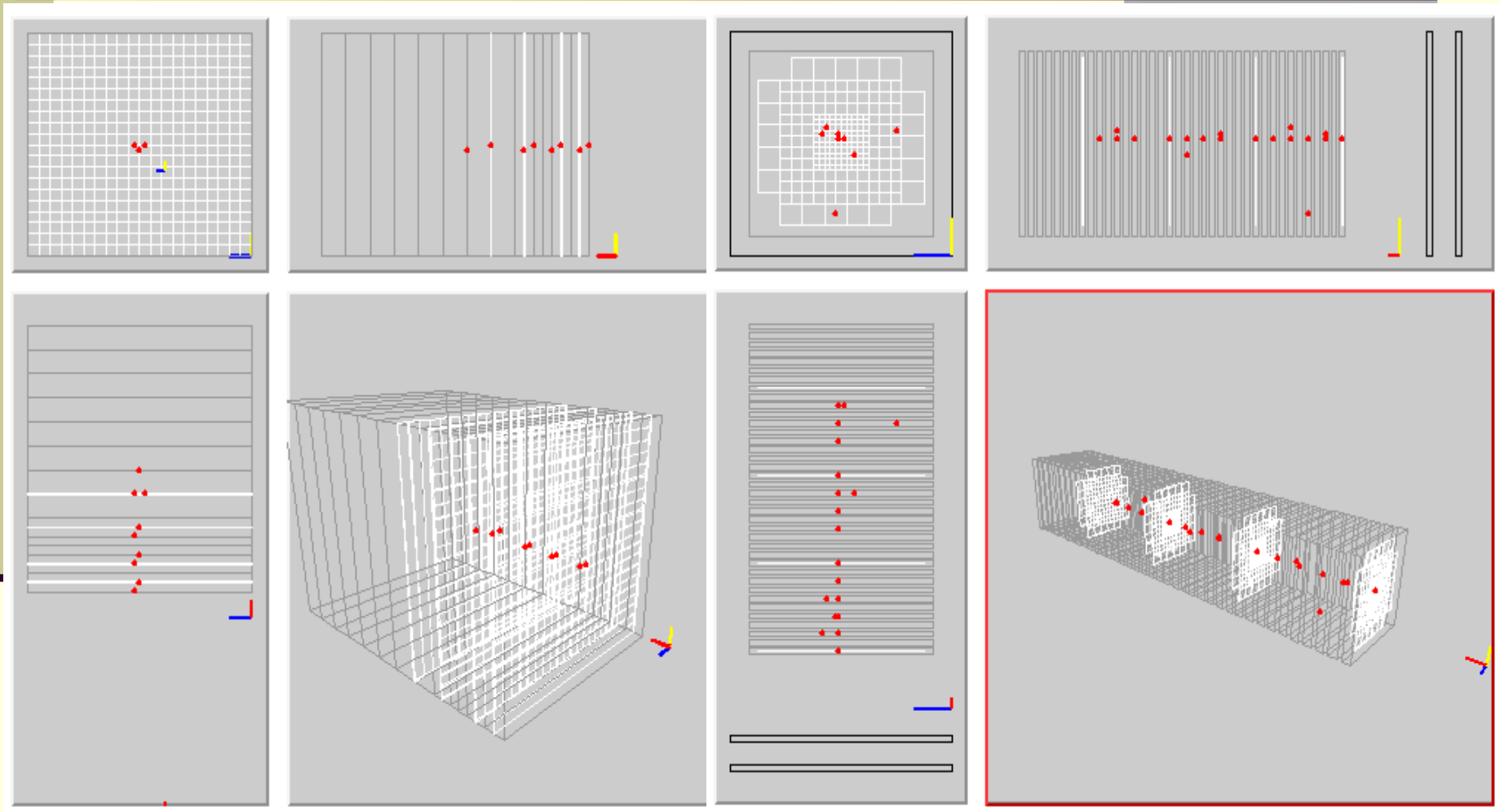


CALICE preliminary:
Efficiency vs. rejection
for TCMT strips:
* for E > 0.4 mips,
typically > 90% effic
with > 90% rejection

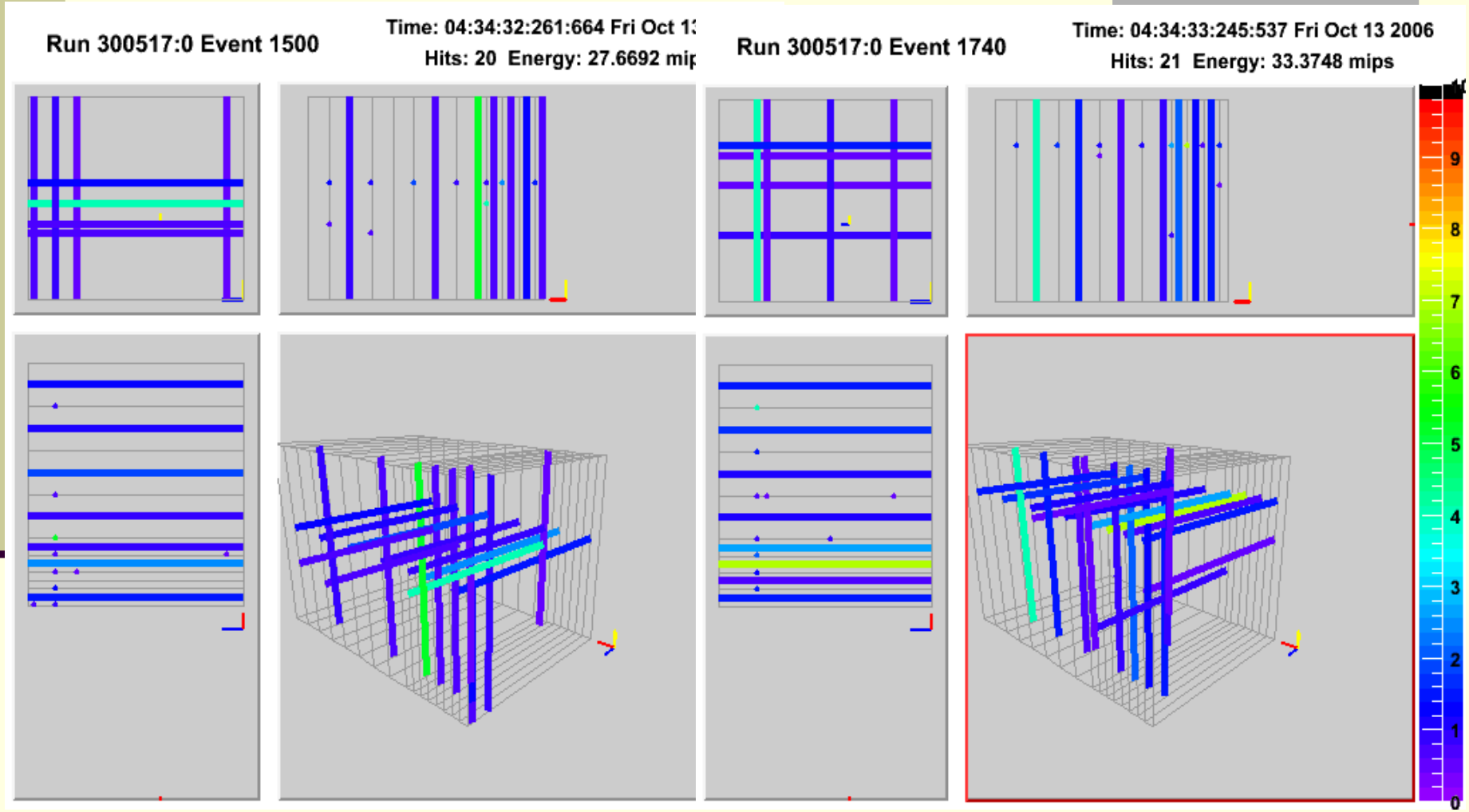
Muon Event

TCMT

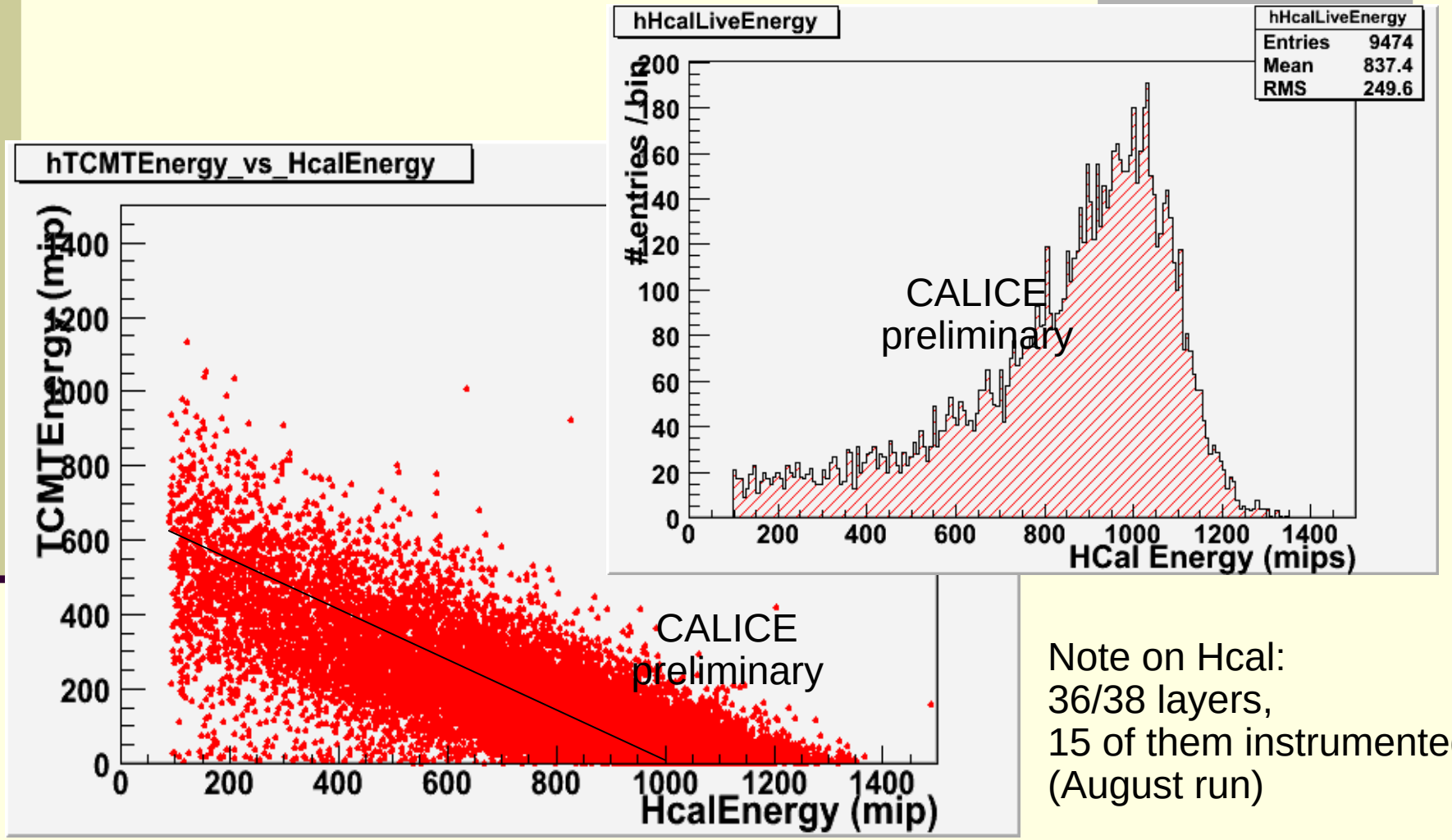
HCAL



Updated event display (muons)



80 GeV pions: Hcal x TCMT correlation



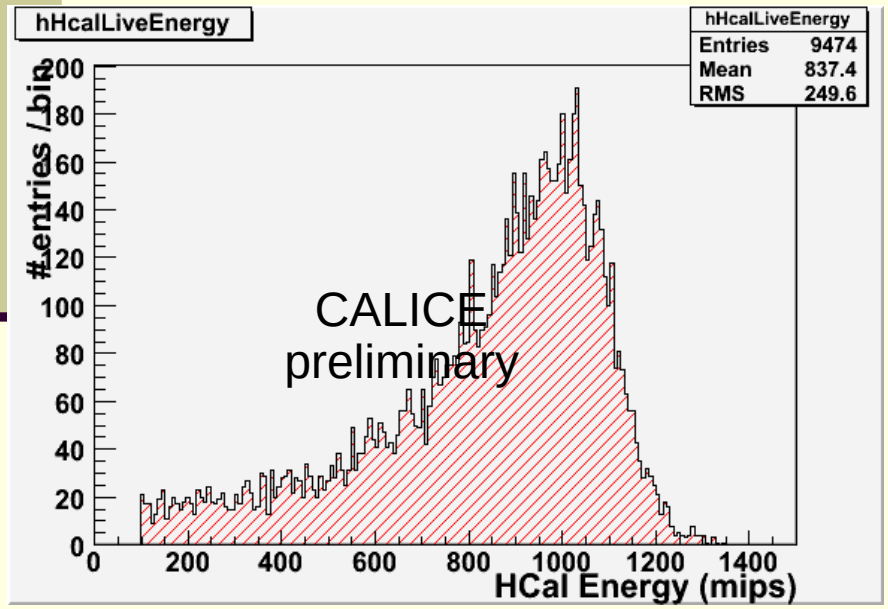
Note on Hcal:
36/38 layers,
15 of them instrumented
(August run)

80 GeV Pions – adding TCMT energy

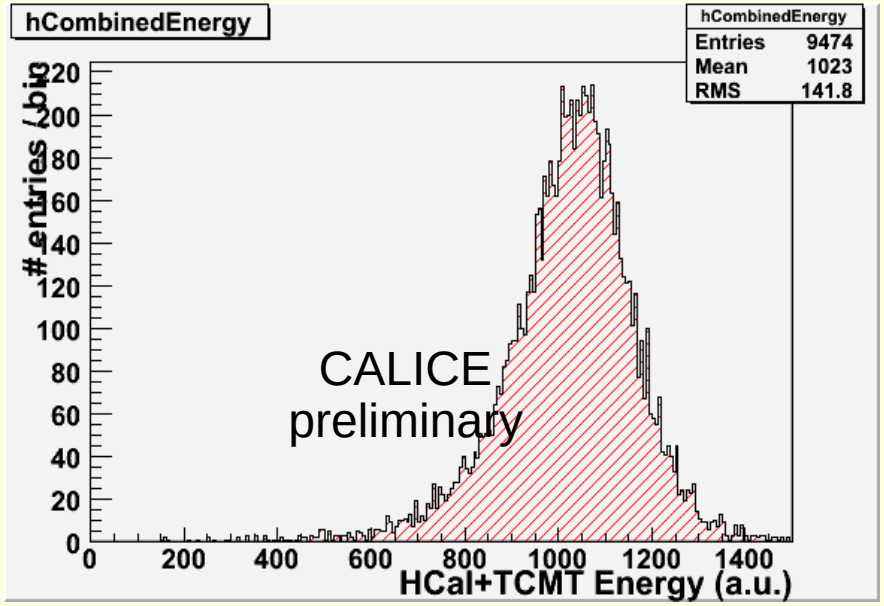
Combining the TCMT hits:
a factor of 1.4445 was applied to the TCMT hits

Much better, but Ecal hits not included yet... **Work in Progress !**

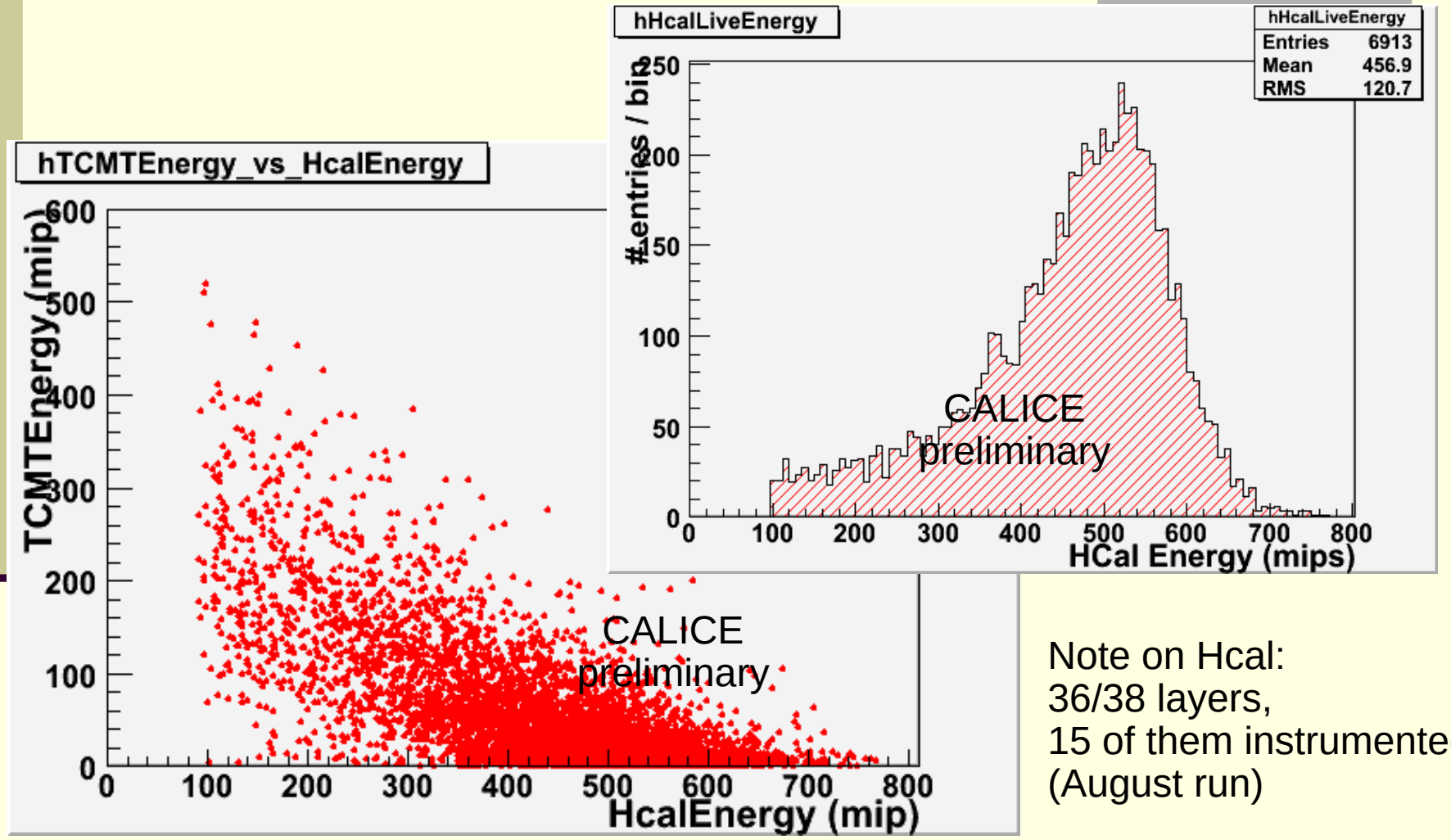
HCal only



HCal + TCMT



30 GeV pions: Hcal x TCMT correlation



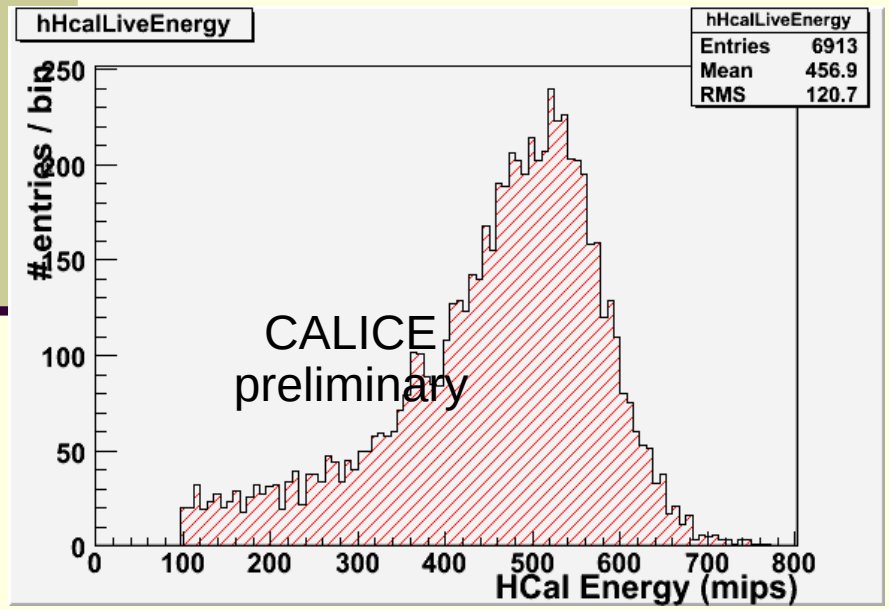
Note on Hcal:
36/38 layers,
15 of them instrumented
(August run)

30 GeV Pions – energy reconstruction

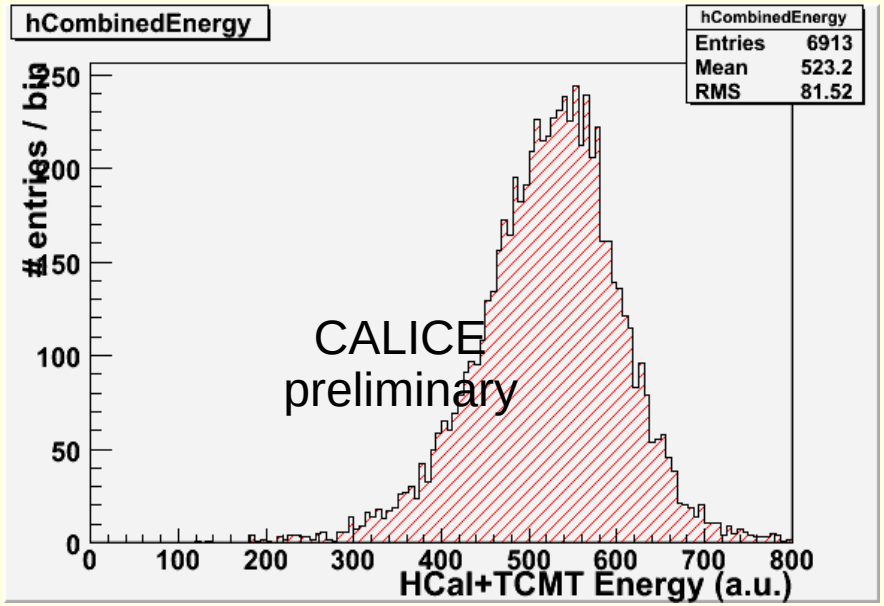
Combining the TCMT hits with the HCal:
a factor of 1.4445 was applied to the TCMT hits

Much better, but Ecal hits not included yet... **Work in Progress !**

HCal only



HCal + TCMT



Summary

- Valuable experience with a TCMT prototype with a few hundred cells
- Preliminary results are very encouraging, more data analysis is in progress
- Software development: TCMT reconstruction into the official Calice software framework, and final TCMT geometry into Mokka (v6.2)
- Data taking under way at CERN until next week
- **For the DCR**, we suggest using the plots for the TCMT efficiency vs. rejection and the TCMT+HCal energies combined.