Cosmics with Inner HCAL

Abhisek Sen, John Haggerty, Megan Connors

Fully assembled inner HCAL

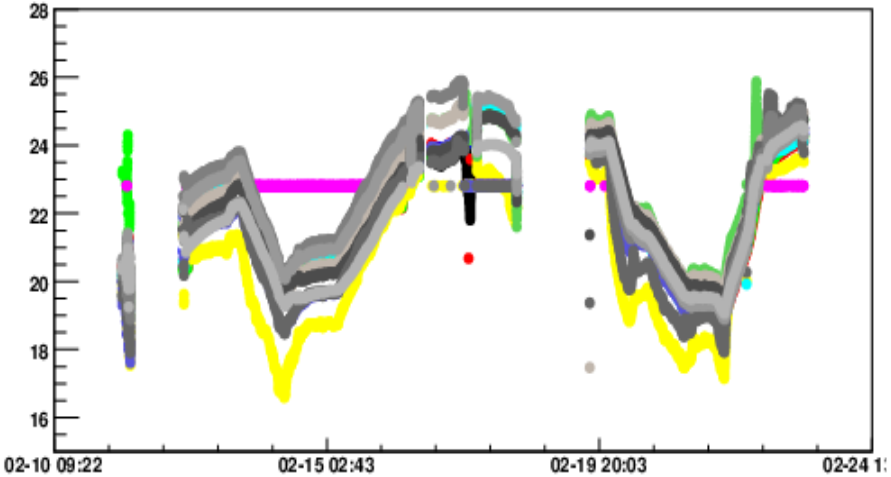
Where are we?

- Things in place: Tiles, Wedges, SIPMs, PreAmps, LEDs, Connectors.
- We are now in testing phase:
  - Steve's new controller board
    - temperature, DAC values, bias currents etc.
  - Cosmic running
    - Scintillator counters
    - Self Triggering
- Goal this week:
  - LED (waiting for LED driver debugging to finish)
  - RCDAQ (Martin)

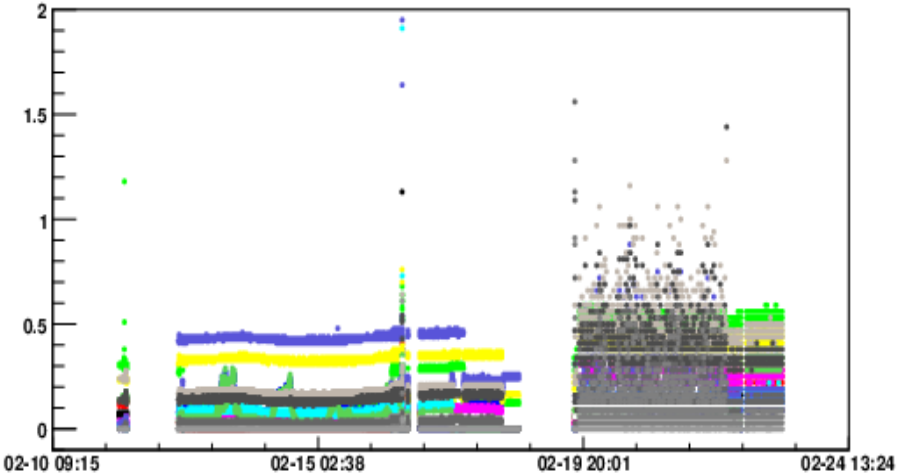
Database logging

- Few python scripts logging temperature, DAC value and bias currents into a database.
- Currently using sqlite3. Do we need pgsql?
- Once we have RCDAQ, we would add some of these in the PRDF as well.

Temperature (°C)

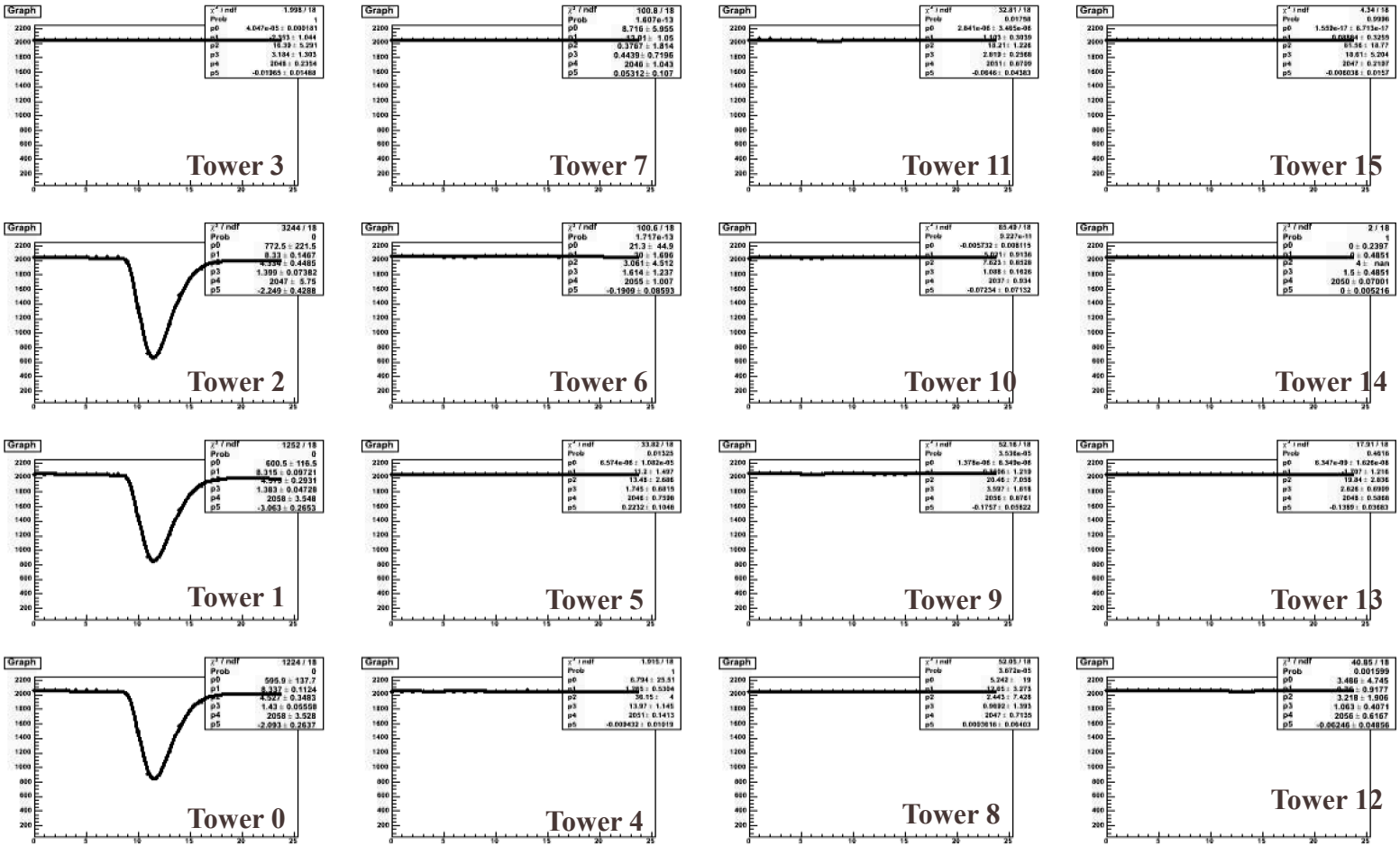


Bias currents (mA?)



Vertical cosmic

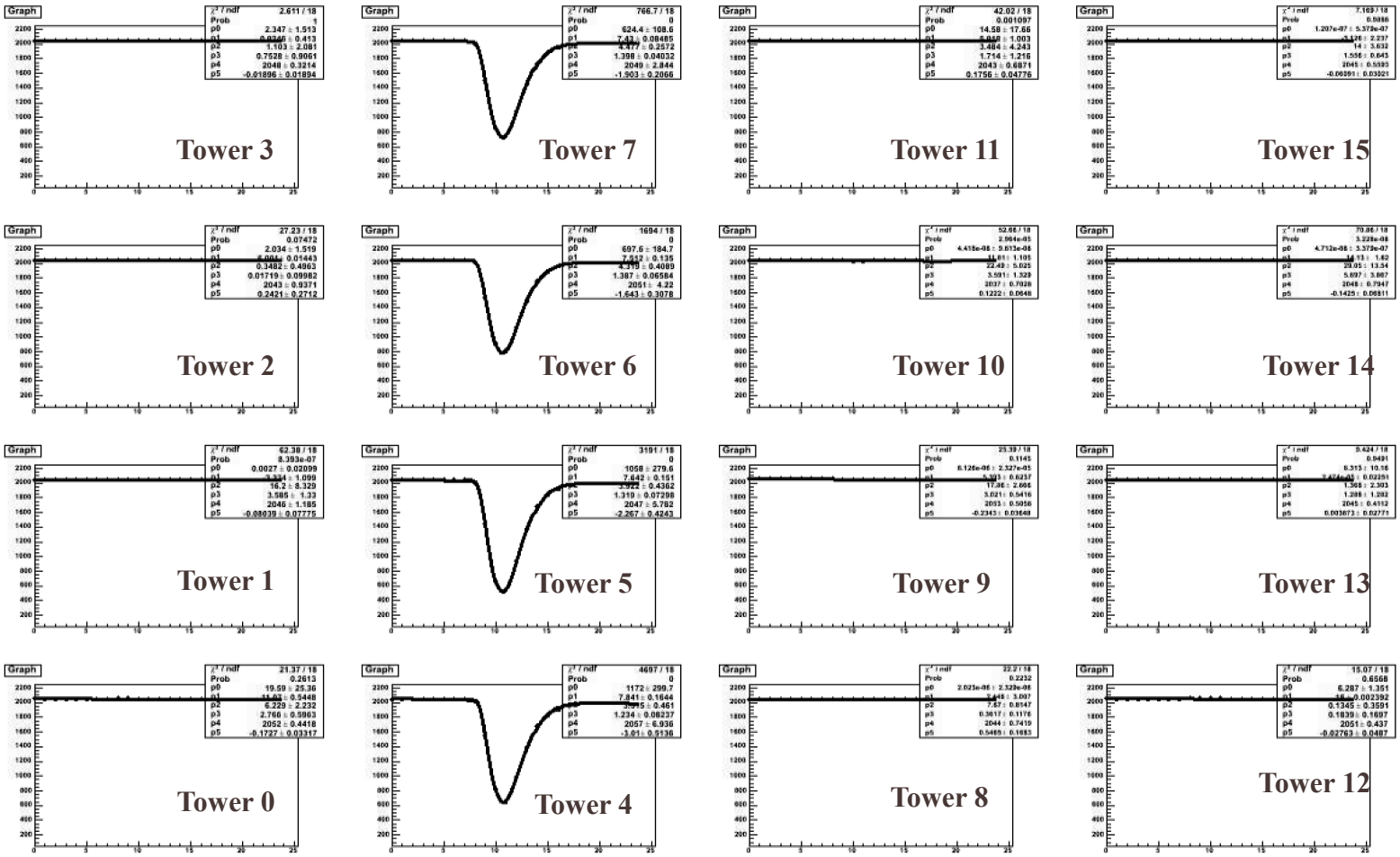
Run 1394



Counters on top and bottom of 0-1-2-3 towers. Tower 3 has no light output.

Vertical cosmic

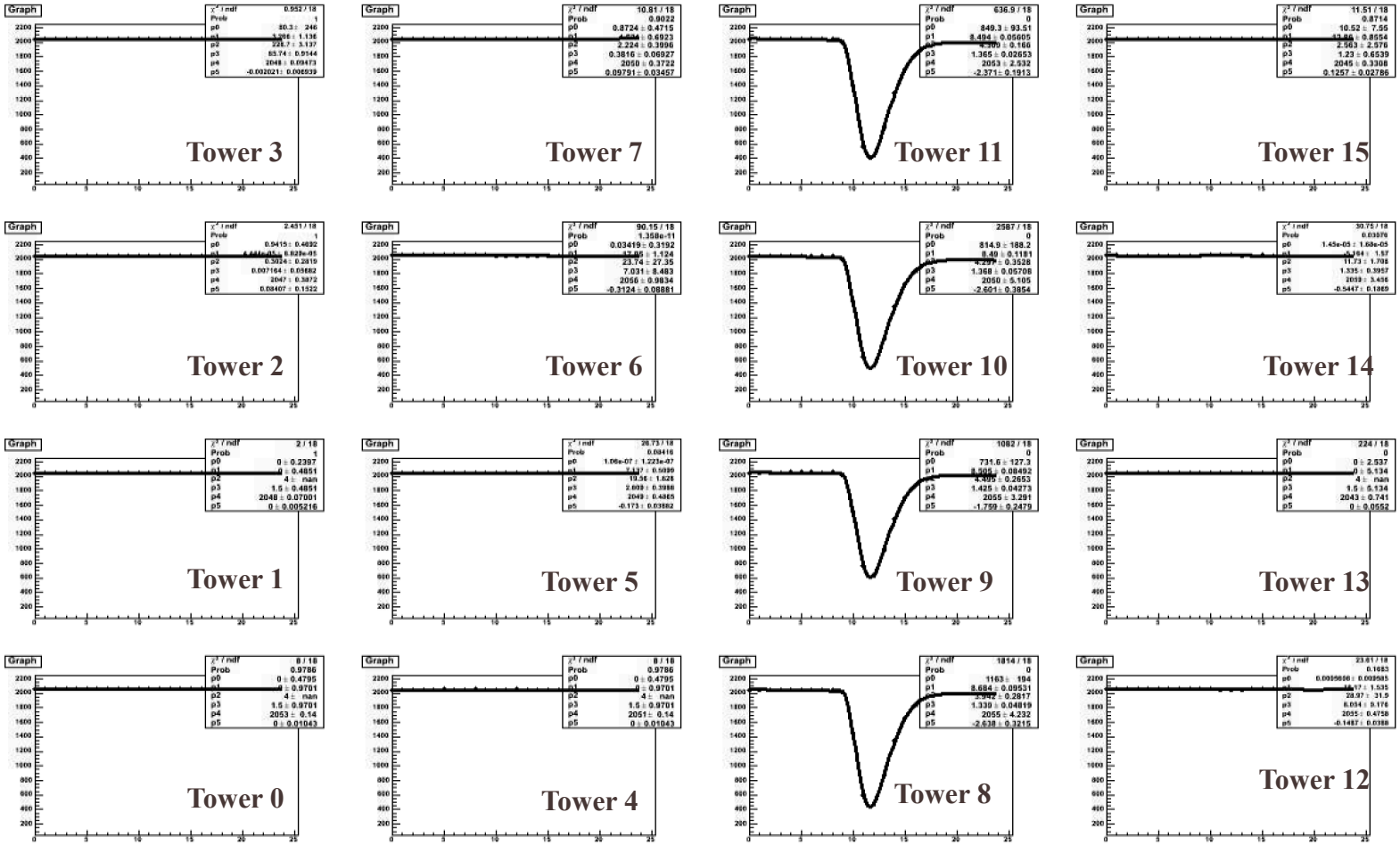
Run 1428



Counters on top and bottom of 4-5-6-7 towers.

Vertical cosmic

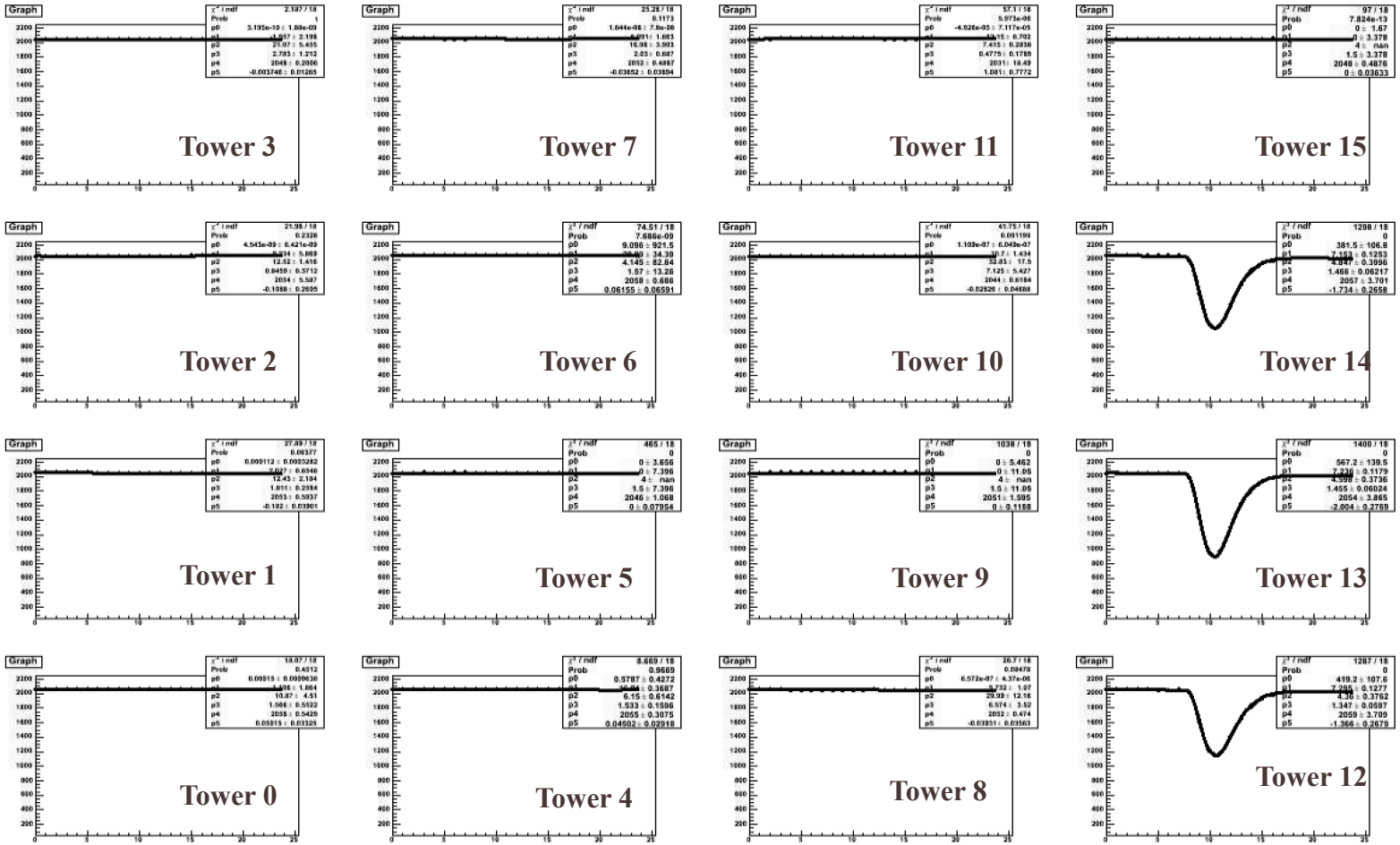
Run 1391



Counters on top and bottom of 8-9-10-11 towers.

Vertical cosmic

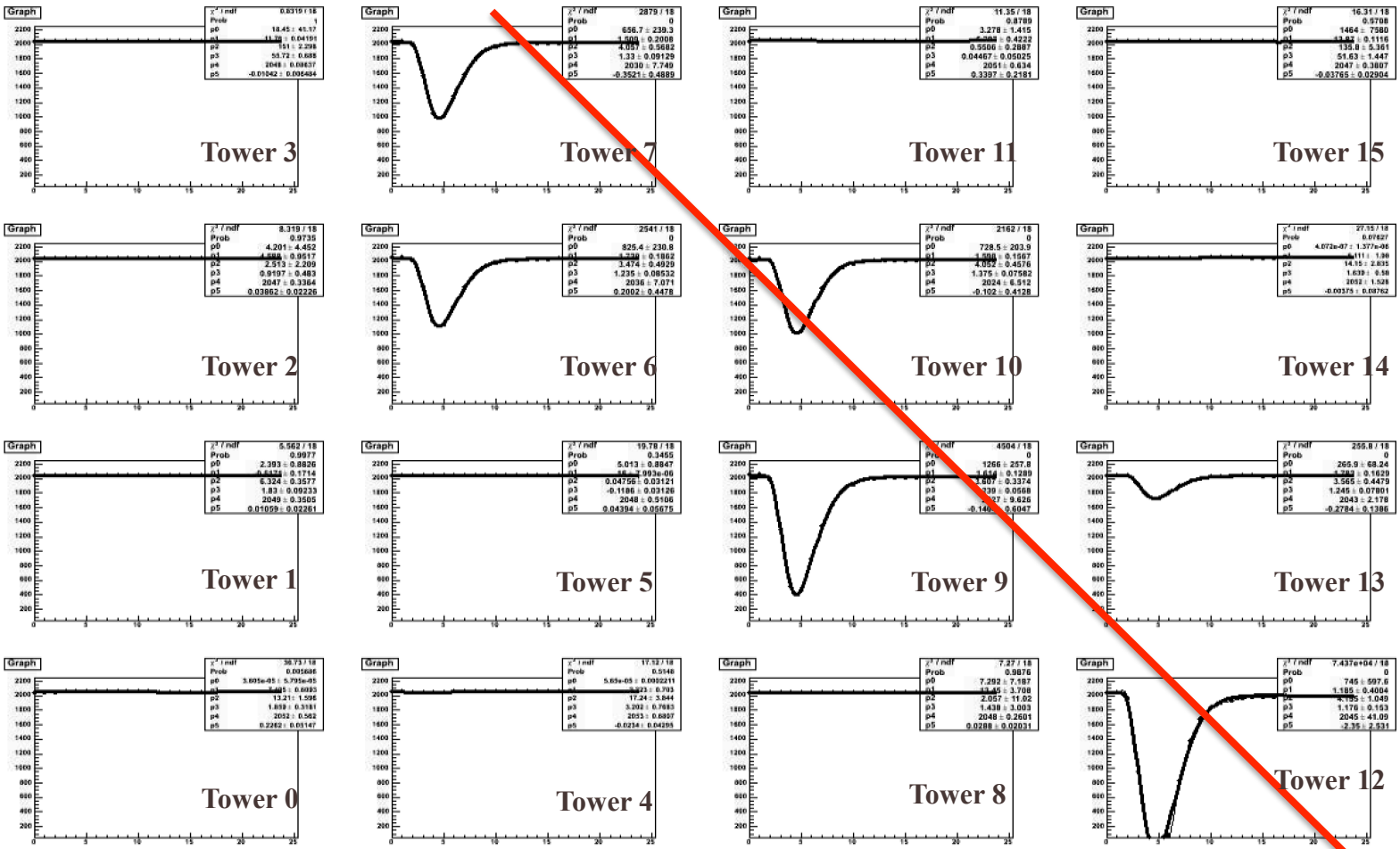
Run 1416



Counters on top and bottom of 12-13-14-15 tower. Tower 15 has no light output.

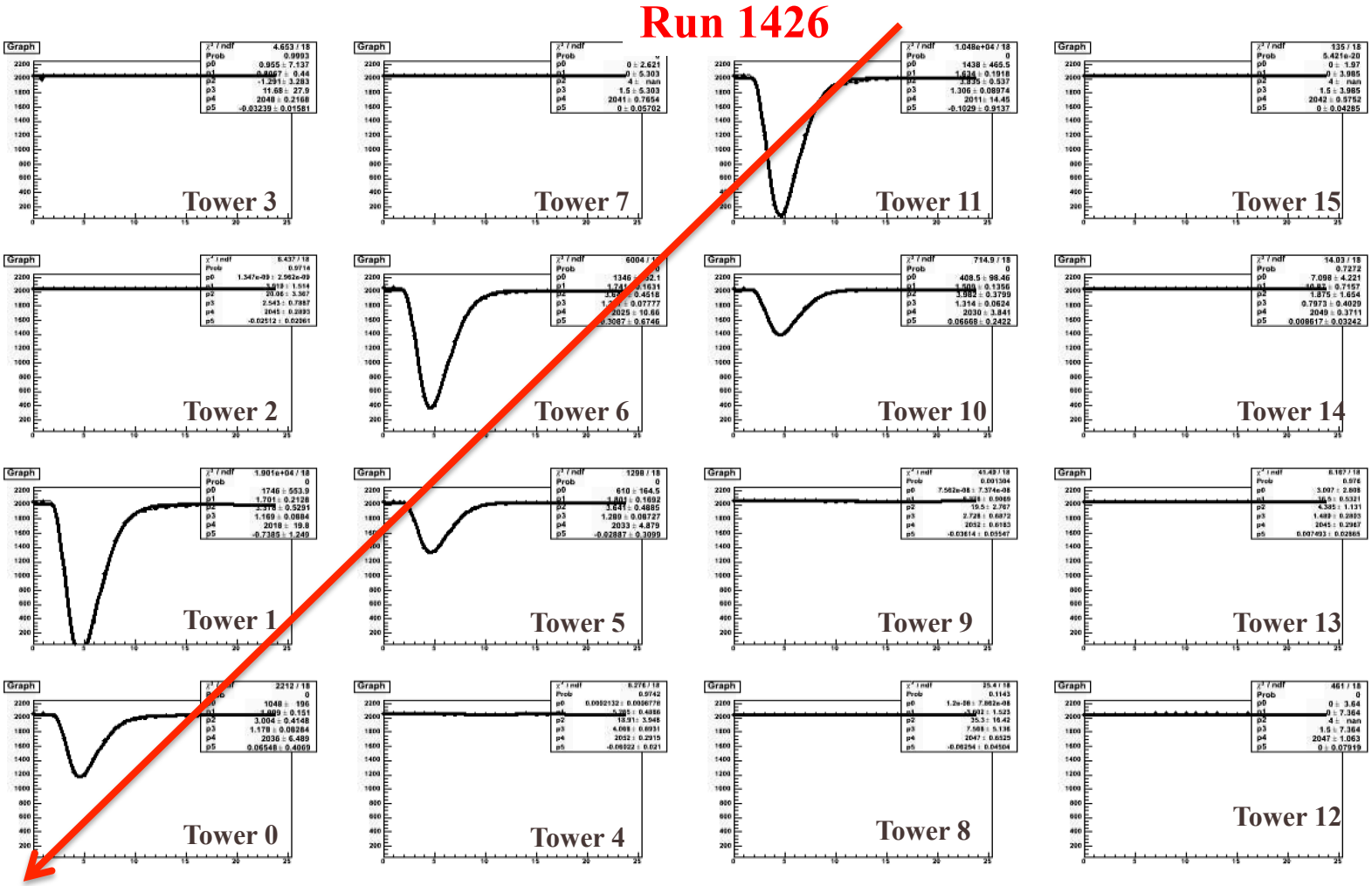
Cosmic – Self triggered

Run 1426



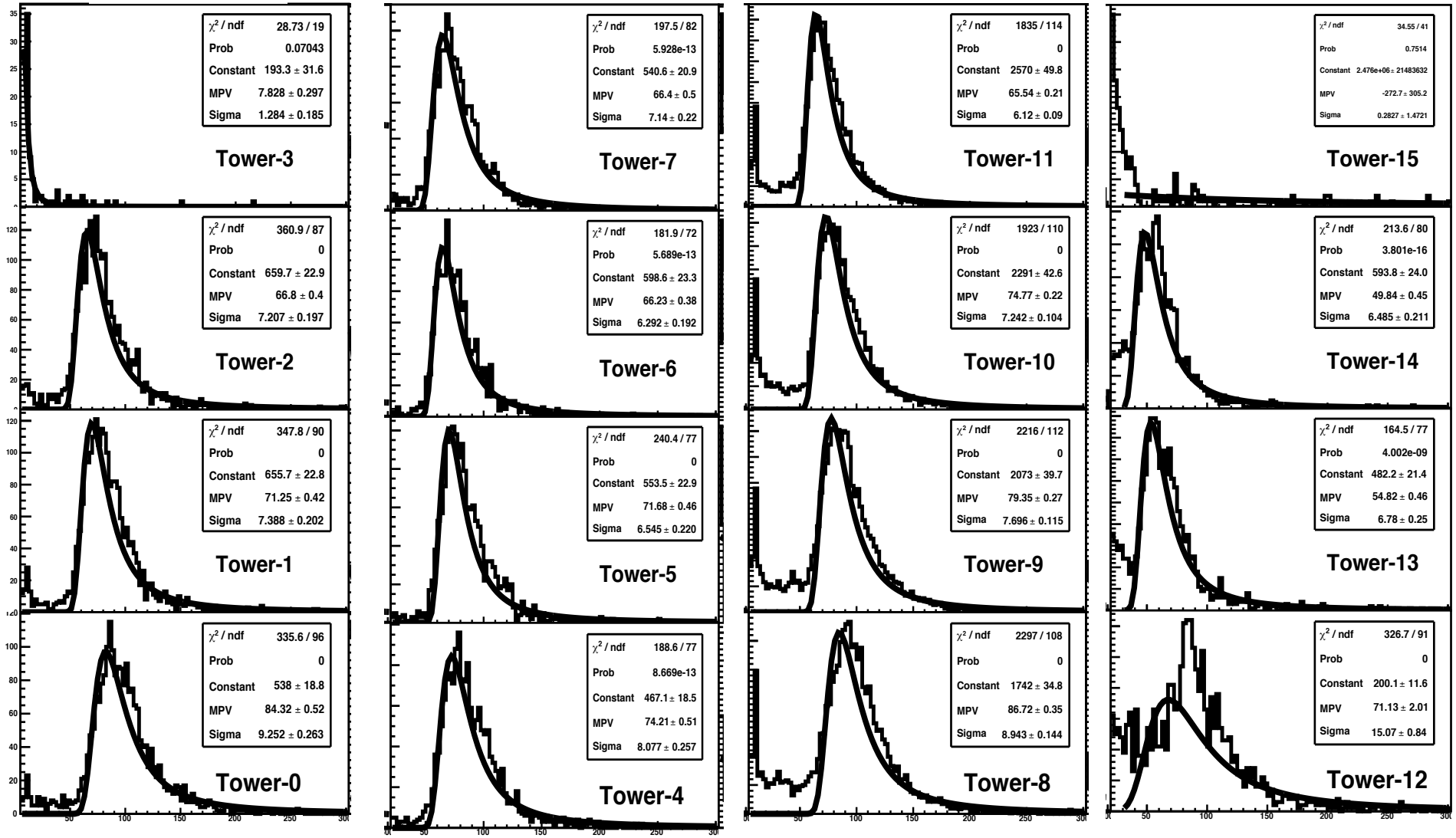
Configuration:
ADCSUM>39 (low gain channels only)
nHIT > 3 (out of 16)

Cosmic – Self triggered

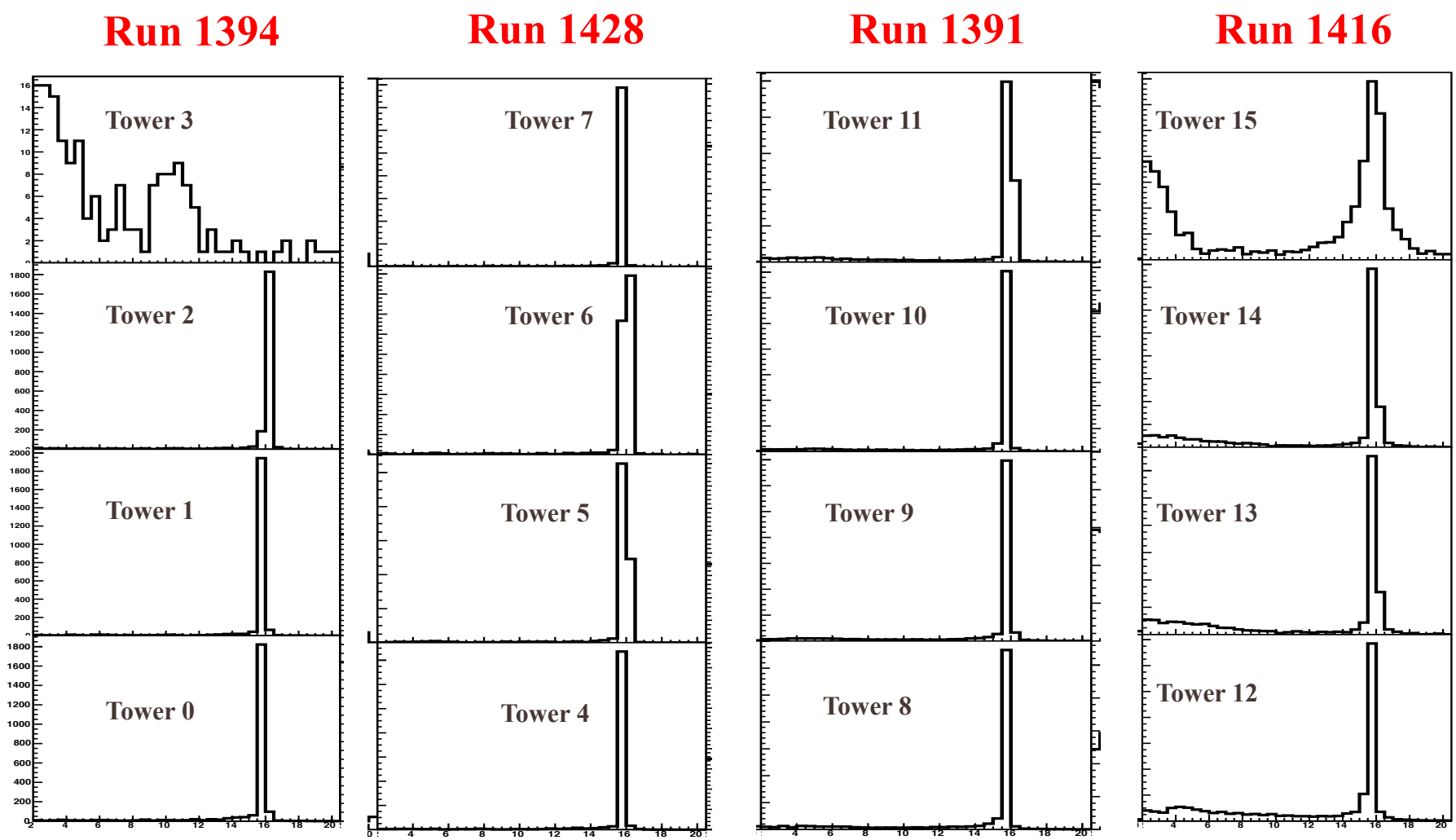


Cosmic Landau Signal

Run 1394 | **Run 1428** | **Run 1391** | **Run 1416**

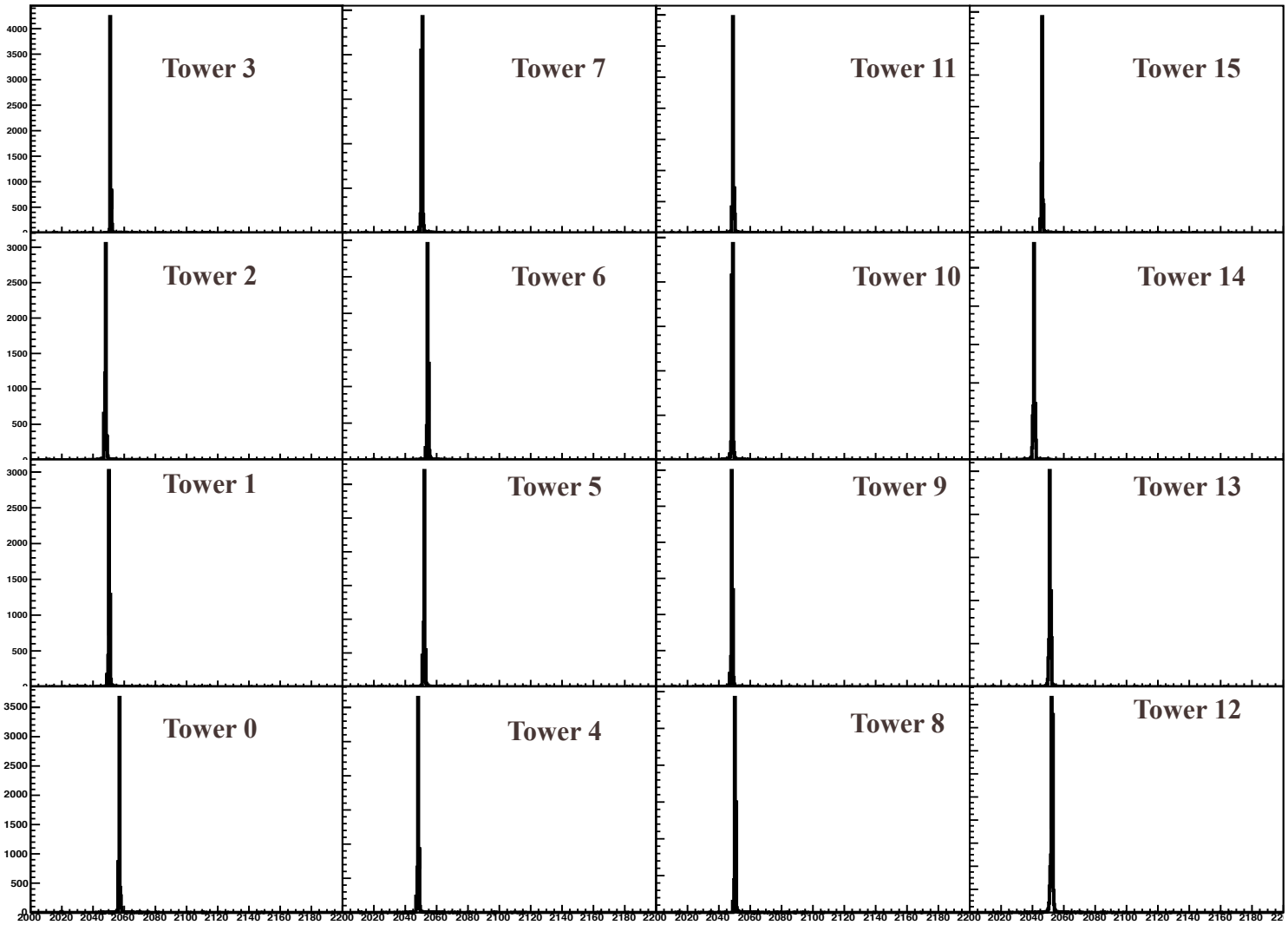


Gains



Gains look very consistent for all the channels.

Pedestal resolution



Very consistent pedestal.

Analysis framework

with Fun4All

HCalUnpackPRDF

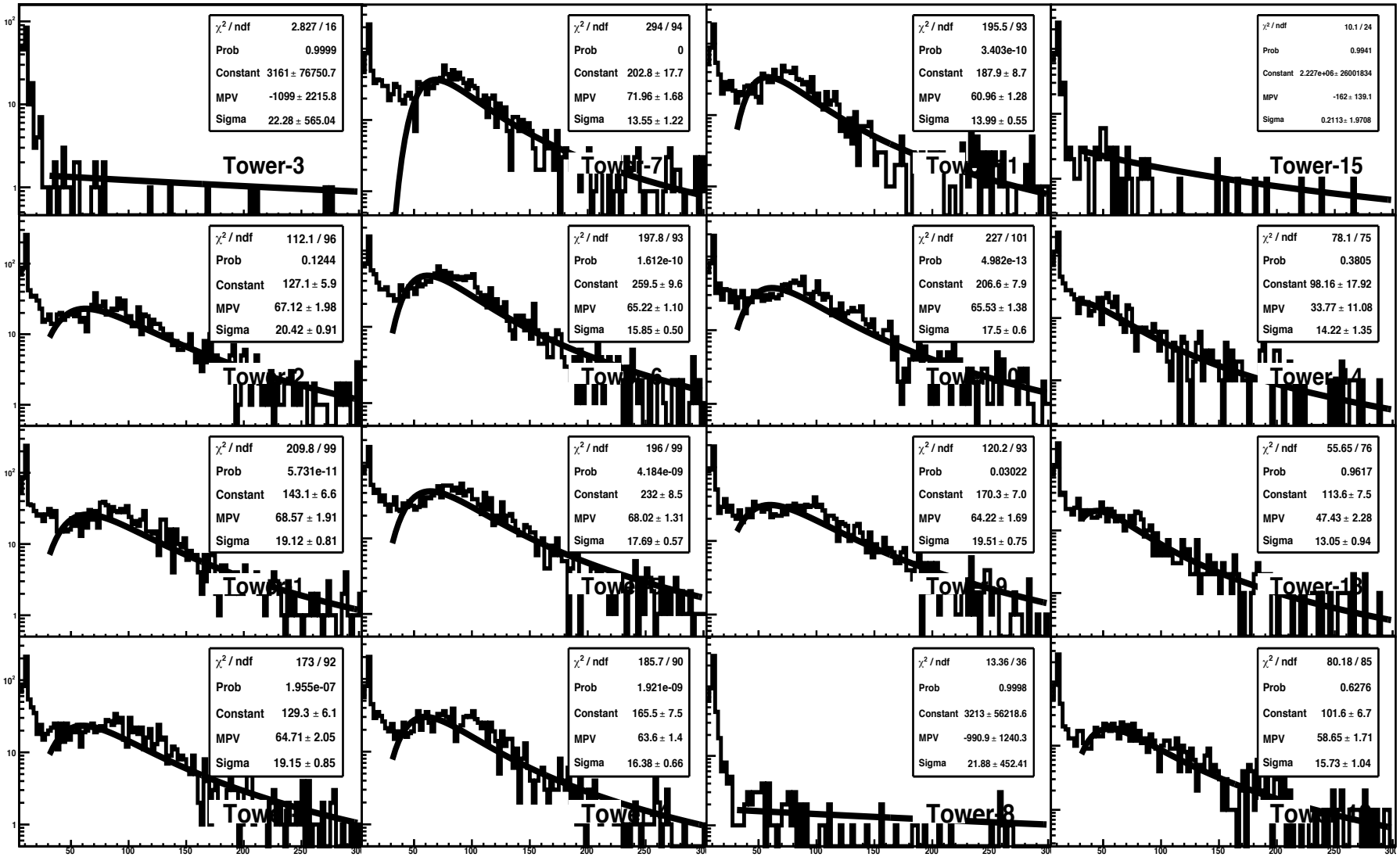
Fill sPHENIX tower objects same as simulation

Currently PRDFs can't be read with sPHENIX library but works well with PHENIX library. Martin will look into it.

Easy for anyone to add their own fun4all module.

without Fun4All

JohnH and I have our own version of codes which just loops over the events and dump all in a root file.

BACK-UP

Cosmic Landau in self-trigger