Test beam update

Joe Pastika & Nadja Strobbe
2015/08/27

Summary of last week

- Plan was the following:

  A. Pion energy scan for normal ODUs

  B. Muon eta-phi scan for special ODU

  C. Pion energy scan for special ODU

- Full plan completed, and supplemented with muon runs for Phase2 studies

Observed issues

- **Beam files** needed lots of tuning (Thanks Tatiana!) during data taking. Mostly after an intervention.
- We suspect that there was a **brief FE power outage** on Monday morning.
  - The links went bad, the SiPM BV channels got switched off, and the peltier cooling was turned off.
  - Fix was to power cycle the front end twice, and loading the correct setting in ccmServer.
- Late Monday evening we noticed that the **peltier** for the RM with ODU4 **went crazy**.
  - The temperature bounced between 16 and 23°C, and then dropped to about 12°C. It seemed stuck in fully on state.
  - We called the control room and had the shifters power cycle the front-end. This solved the problem, but we do not know what caused it.

Observed issues

- On Tuesday, the **cooling system** failed because of a broken fan.
  - This caused the temperature of the RMs to skyrocket, reaching 42°C in the SiPM enclosure and about 48°C in the card pack
  - The system was turned off until we found and fixed the problem
  - We temporarily fixed it by applying external fans.
- **Link stability** in general needs to be improved. The align BCN number changes for unknown reasons to us, and this causes the links to go bad rather quickly.

Clean-up on Wednesday

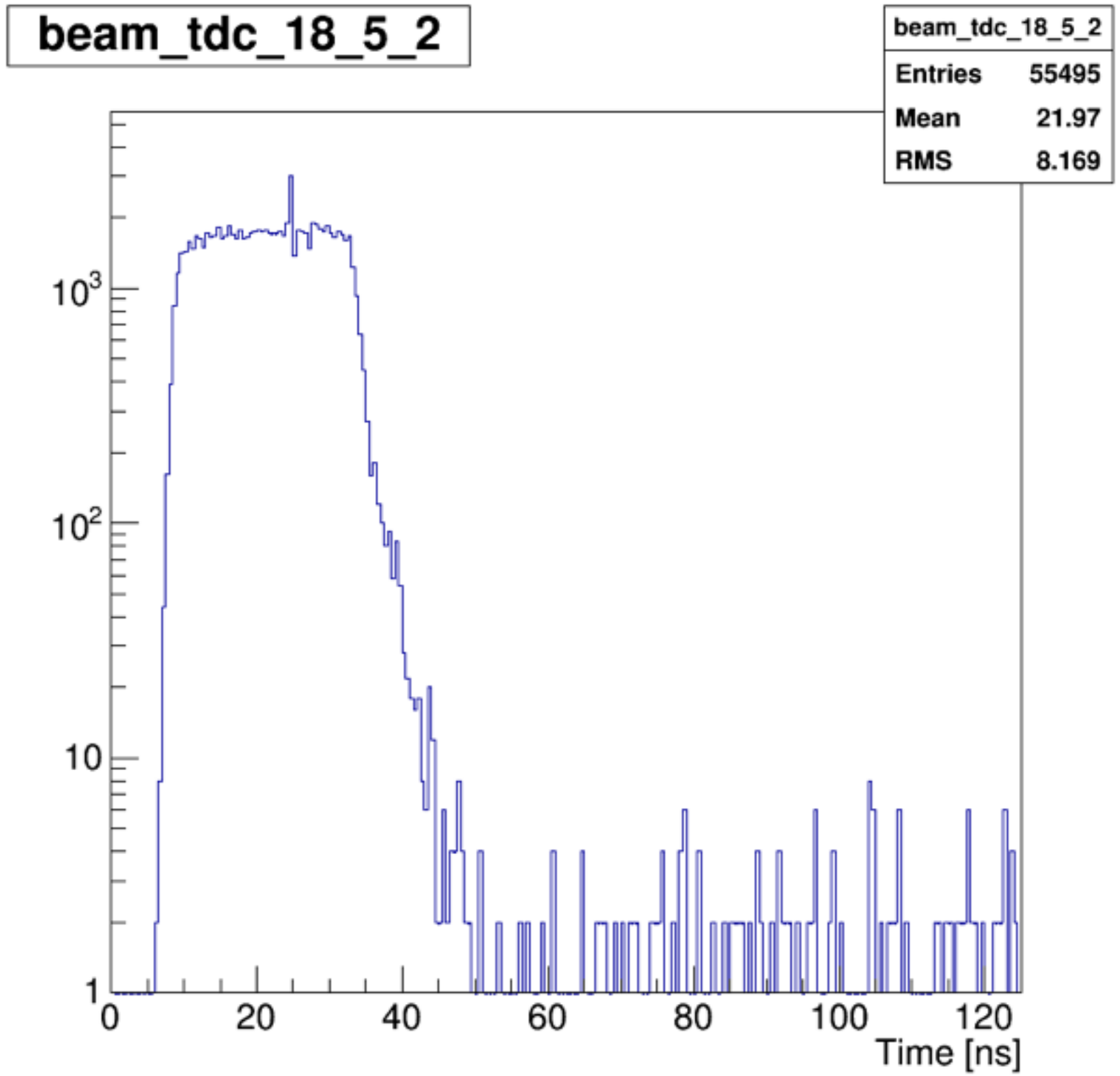
- Yesterday was the end of test beam
- Power test
  - change LV from 8 to 10.5V (steps of 0.5V)
  - observed current drop of about 3-4A
  - Zener diode in LV box on the RBX blew up, otherwise things appeared fine
- Removal of Ph1 equipment
  - 3 RMS (1 for CERN with only 2 VTTx, 2 for FNAL)
  - 1 CM, stays at CERN, without VTTx
  - CCM crate, ngCCM to be shipped to FNAL
  - glib, to be shipped to FNAL
  - RBX itself stays at H2

First results

- Thanks to Jay Dittmann for all the work on the analysis code!
- Plots using the latest analysis code will appear here: http://cmshcalweb01.cern.ch/hcalTB/Analysis/
- Will show some preliminary results today
- Many more to come in the following weeks.
- Please let us know if you want a particular study to be done

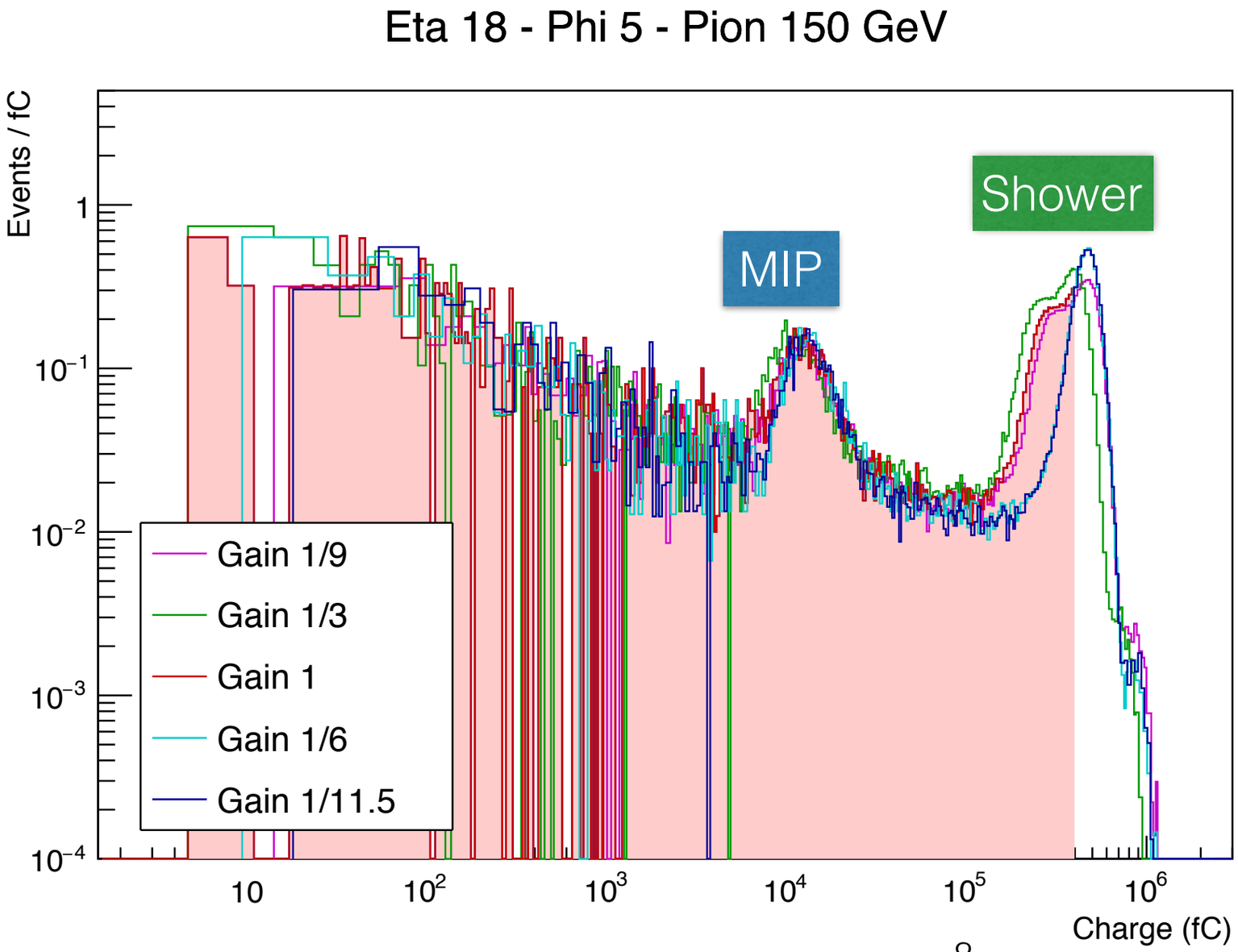
First results

- TDC information
- Beam pointed at Eta 18, phi 5
- Plot is for depth 2
- Pion at 150 GeV
- 5 time samples



First results

- Charge spectrum when varying the QIE shunt
- Plot is for 150 GeV pions (runs 8818, 8819, 8820, 8749, 8750)

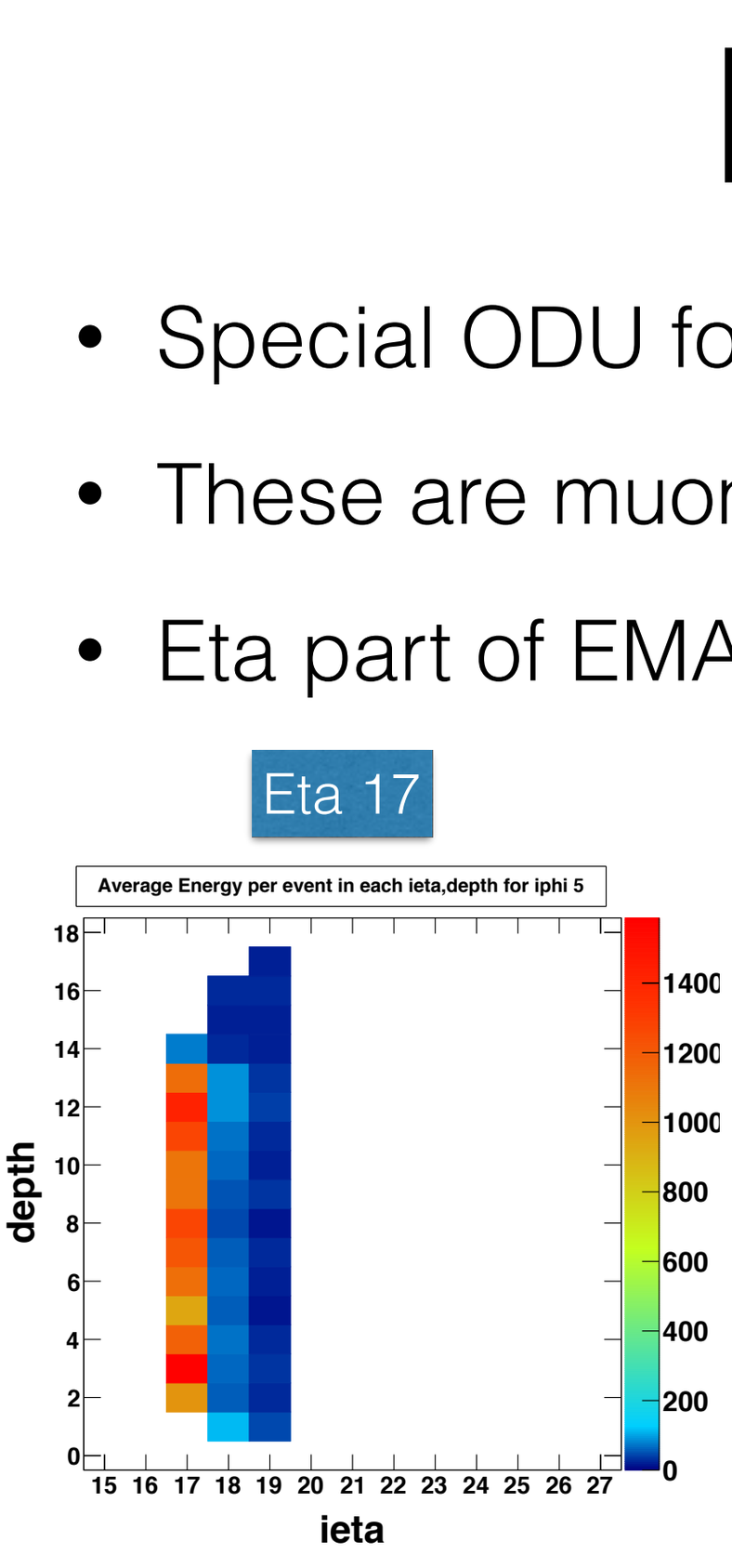


- Weird double-peak profile for 3 of the runs (beam issue?)
- Gain 1 is not sufficient for 150 GeV pions
- Total corrected charge does not depend on gain

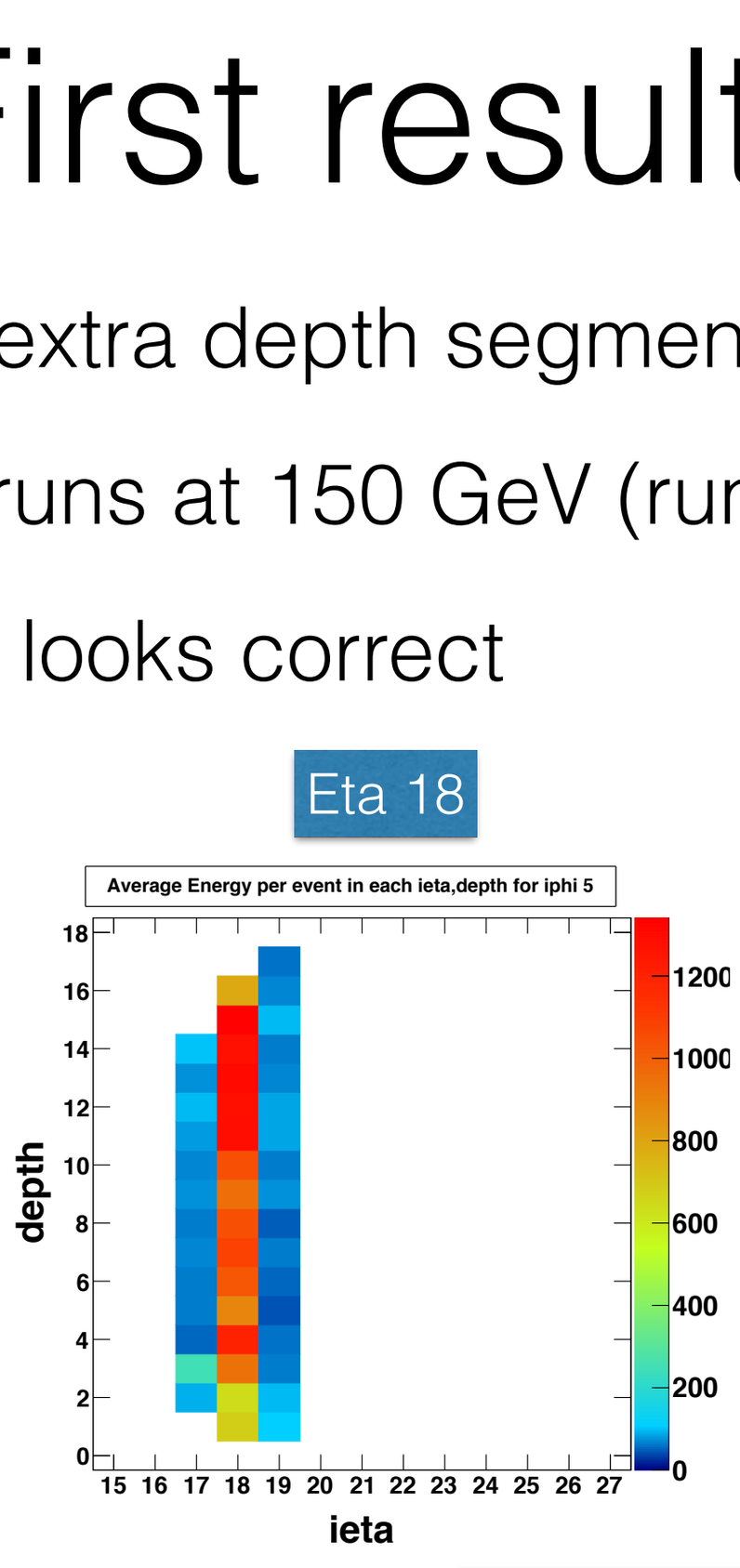
First results

- Special ODU for extra depth segmentation
- These are muon runs at 150 GeV (run 8852, 8853, 8854)
- Eta part of EMAP looks correct

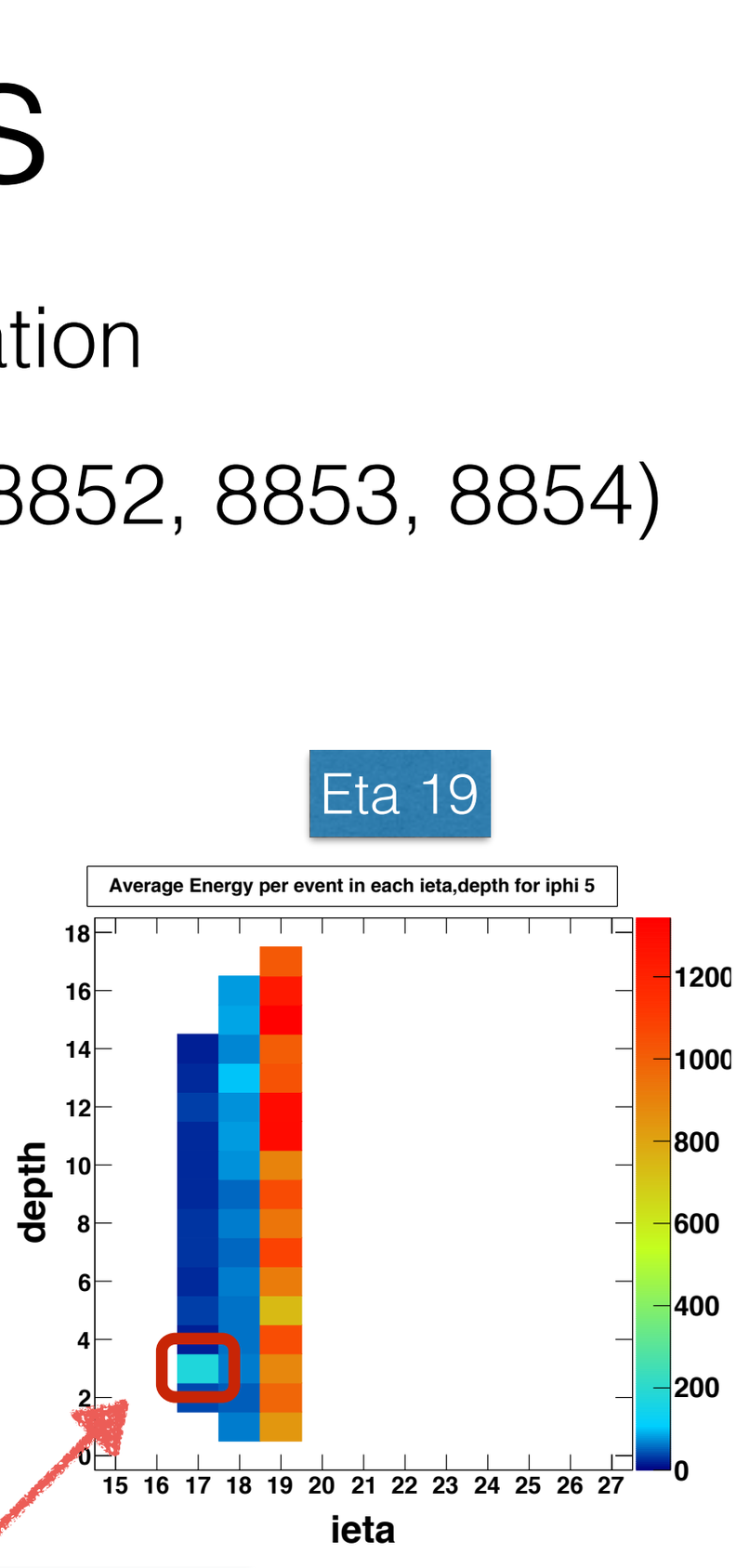
Eta 17



Eta 18



Eta 19

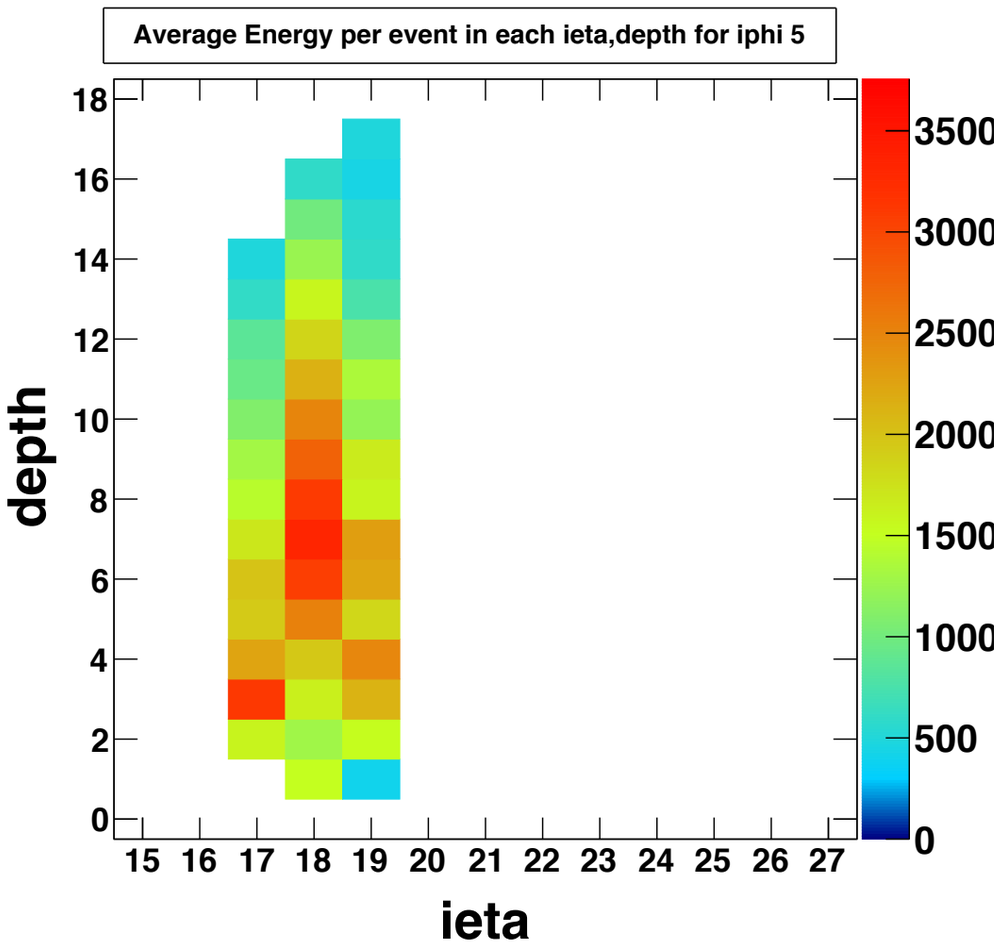


QIE stuck at ~150 ADC

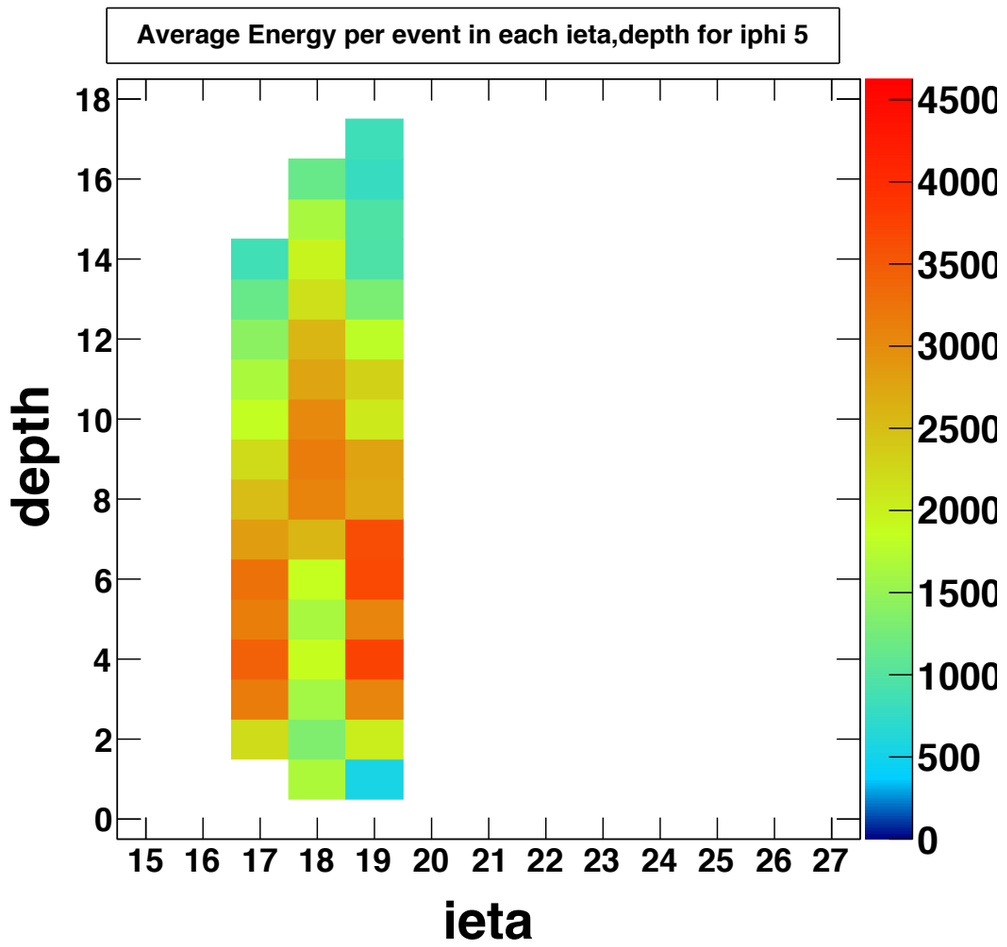
First results

- Special ODU for extra depth segmentation
- These are pion runs at 100 and 200 GeV, with QIE gain 1 and 1/6 (run 8874 and 8882). Beam was pointed at eta 18, phi 5
- Depth behavior strange —> Possible mistake in EMAP, to be investigated

100 GeV pion



200 GeV pion



Thank you

To all contributors to test beam, in particular:

- Alberto Belloni
- Jay Dittmann
- Arjan Heering
- Ianos Schmidt
- Sergey Los
- Tatiana Medvedeva
- all our shifters