SMT Pedestal and Common Mode versus Bunch Crossing

Christophe Clément

DØ SMT Meeting

April 15, 2002

Outline:

- Processed runs,
- Common mode per detector type,
- What has been understood so far,
- Chip pedestal versus tick number,
- What's next?

Processed runs

SMT only:

- Run 148543, Mar 11, 2002
- Run 145771, Feb 8, 2002,
- Run 138387, Nov 19, 2001

SMT+Calorimeter:

- Run 148546, Mar 11, 2002
- Run 138395, Nov 19, 2001
- Run 137670, Nov 15, 2001

SMT+All Sudetectors but CFT:

- Run 148548, Mar 11, 2002

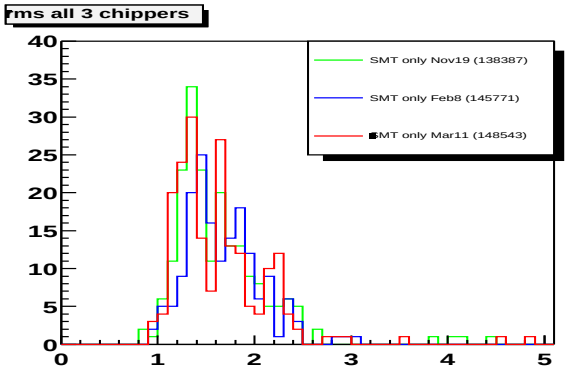
SMT+Muons:

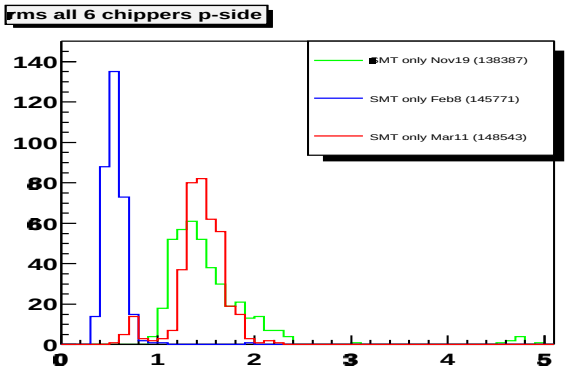
- Run 150946, April 11, 2002

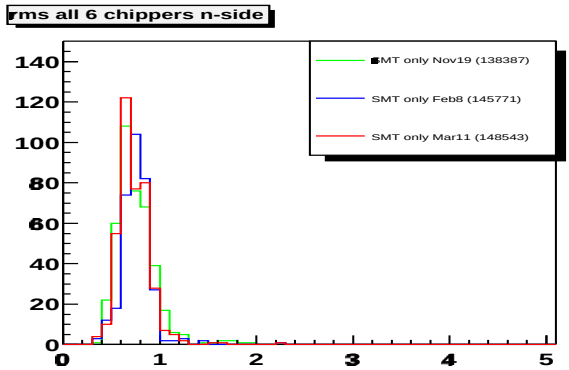
Runs in sparse readout:

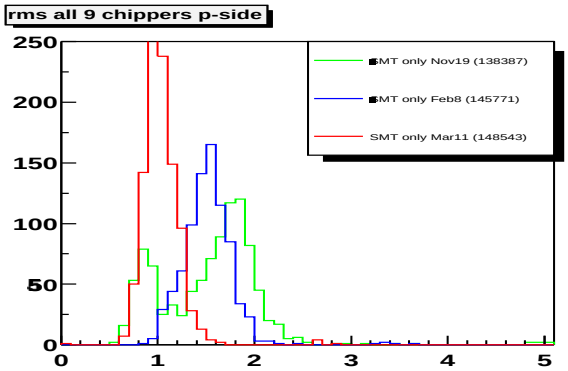
- Run 150951 (SMT+MUO), April 11, 2002
- Run 148727 (global run), March 13, 2002

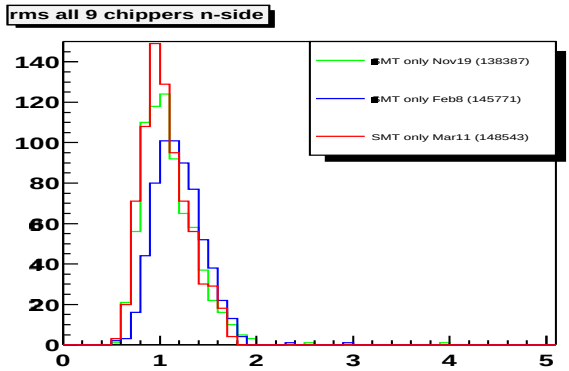
Common Mode per Detector Type in SMT only runs



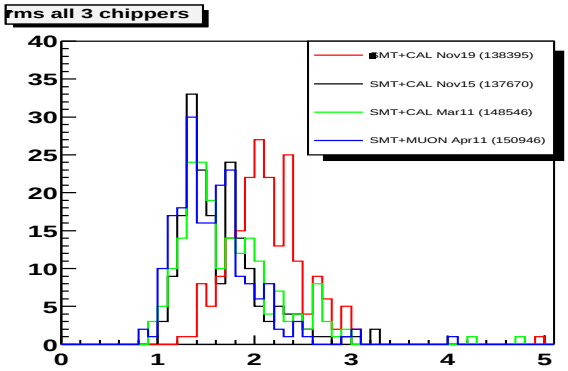


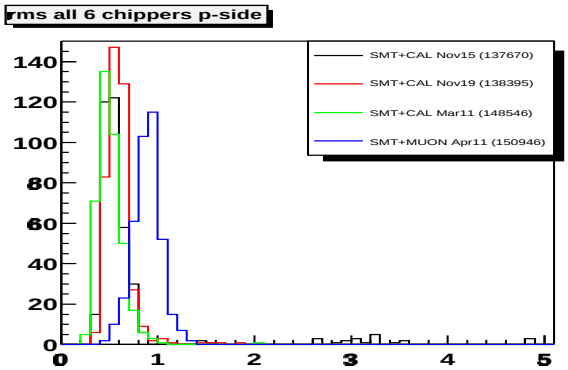


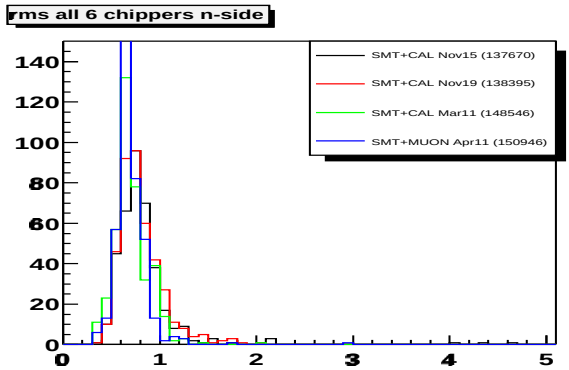


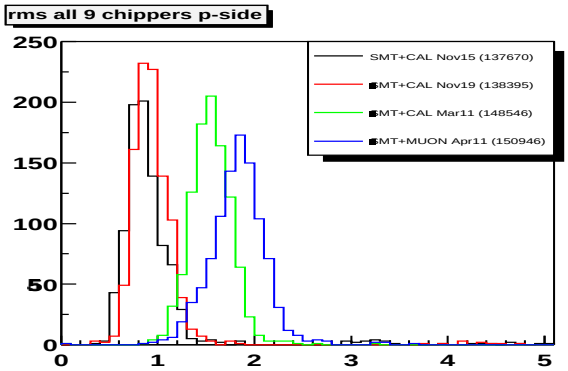


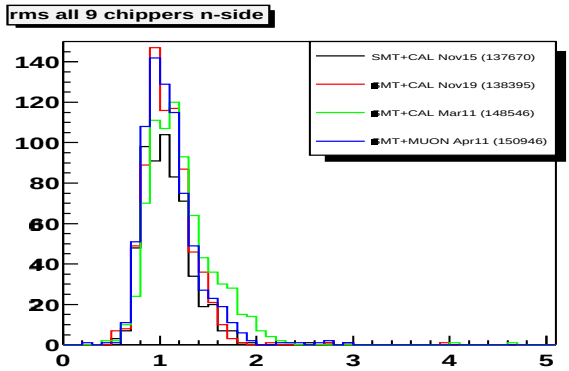
Common Mode per Detector Type in SMT+CAL/ SMT+MUON runs









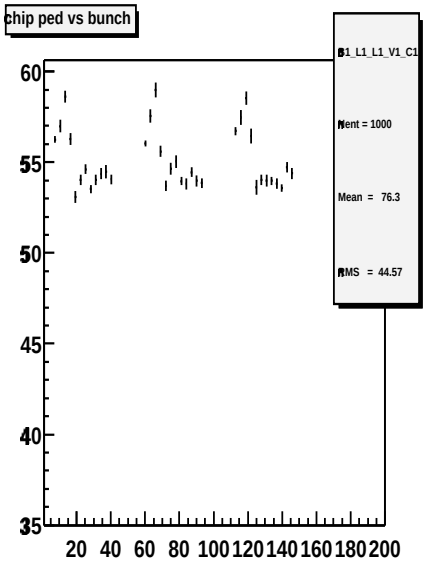


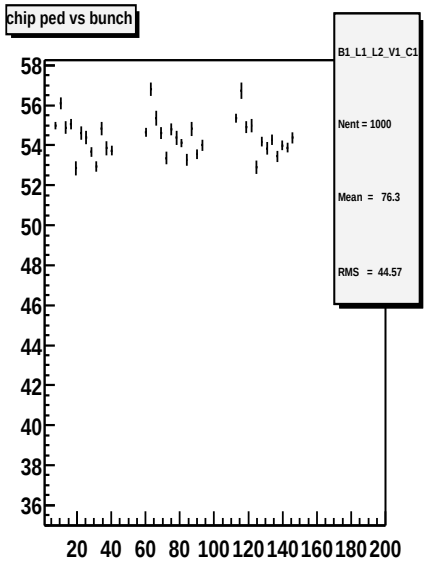
- SMT+all subdetectors but CFT follows the behaviour of SMT+CAL run from March 11

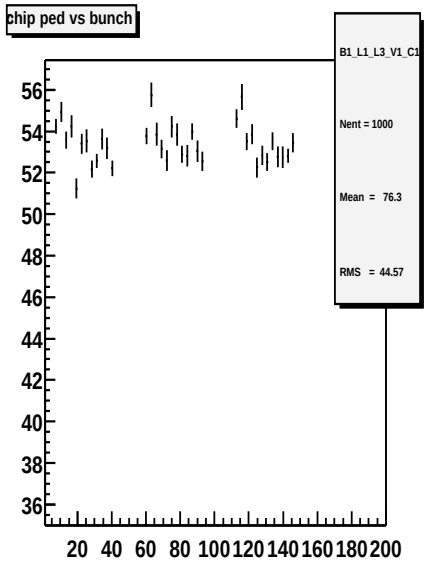
What we have understood so far...

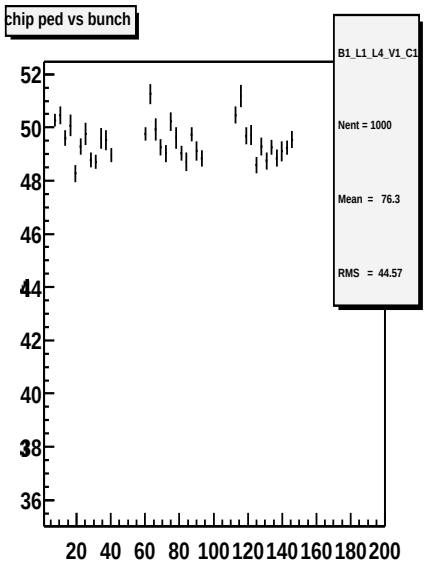
- Common mode constant (versus run) in n-side detectors.
- On 6- and 9-chippers p-side the common mode can be either "high" or "low" depending on the run.
- Bimodal pedestal distributions for 6- and 9-chipper p-side.
- The common mode does not seem to be correlated to other subdetector.
- There are pedestal correlations throughout the detector.

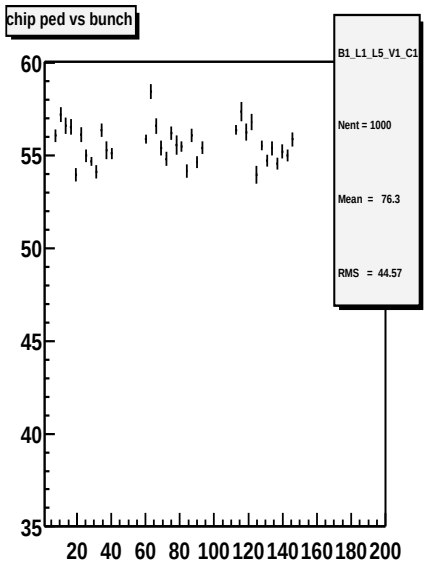
Pedestal versus Tick Number
Run 138387, 3 chippers

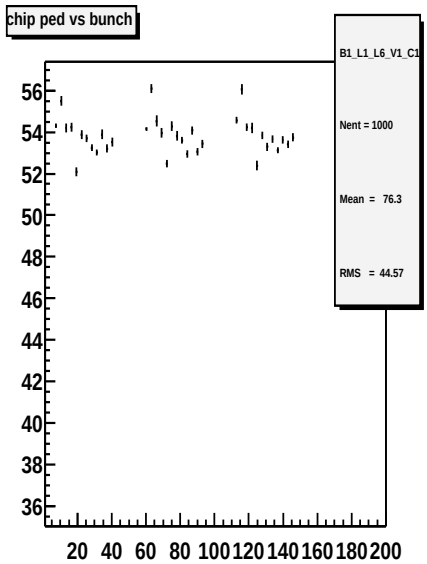




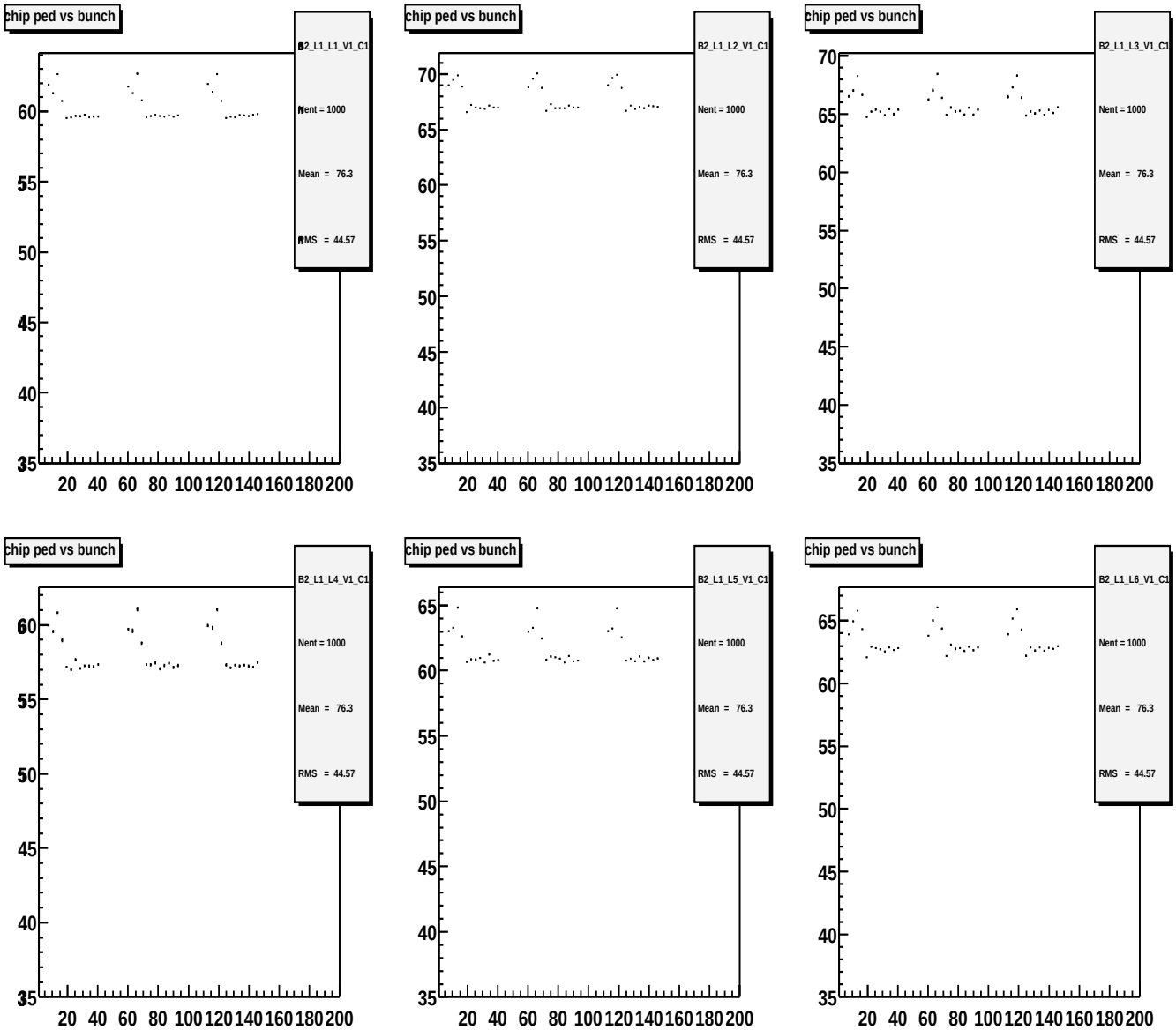




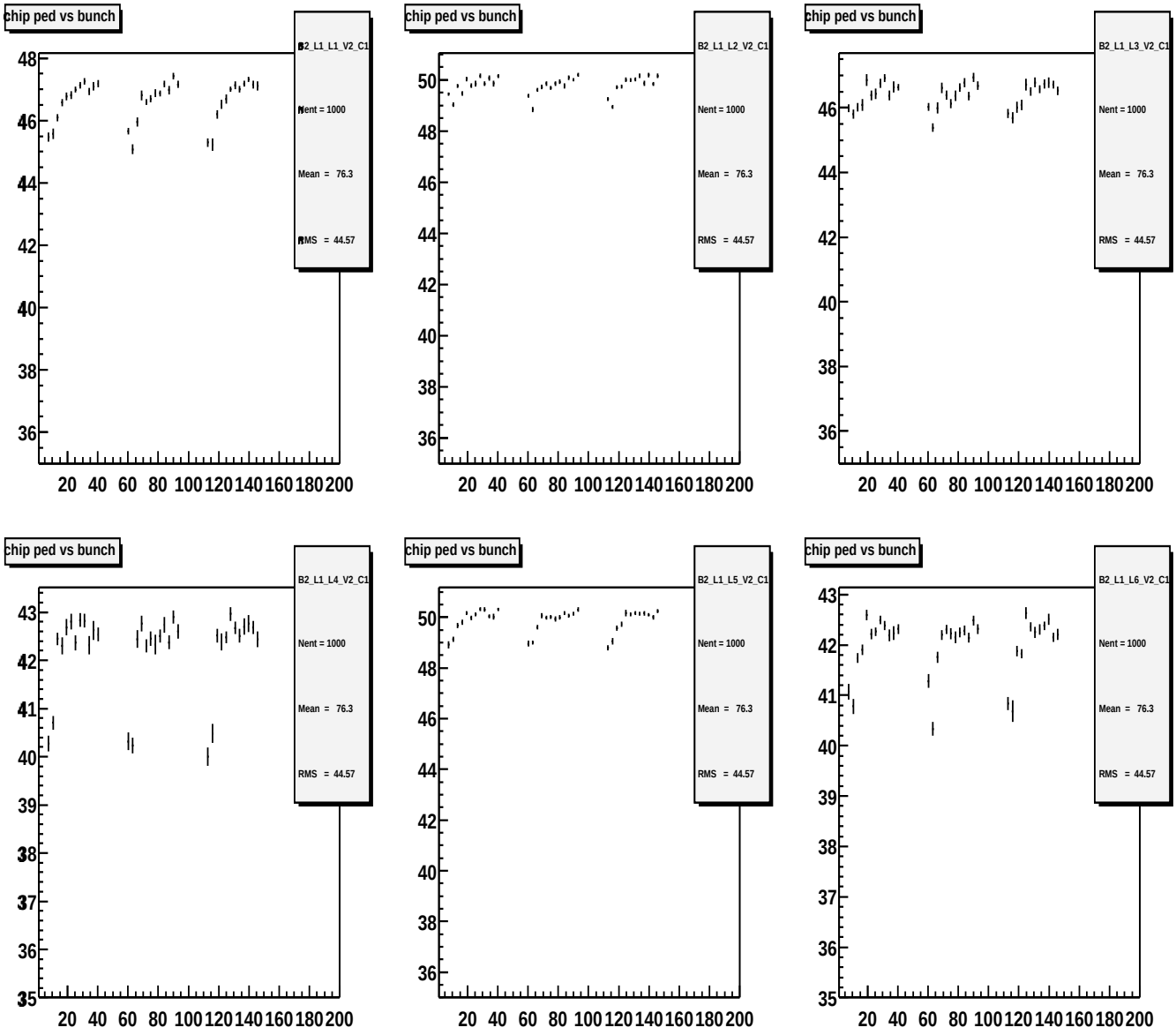




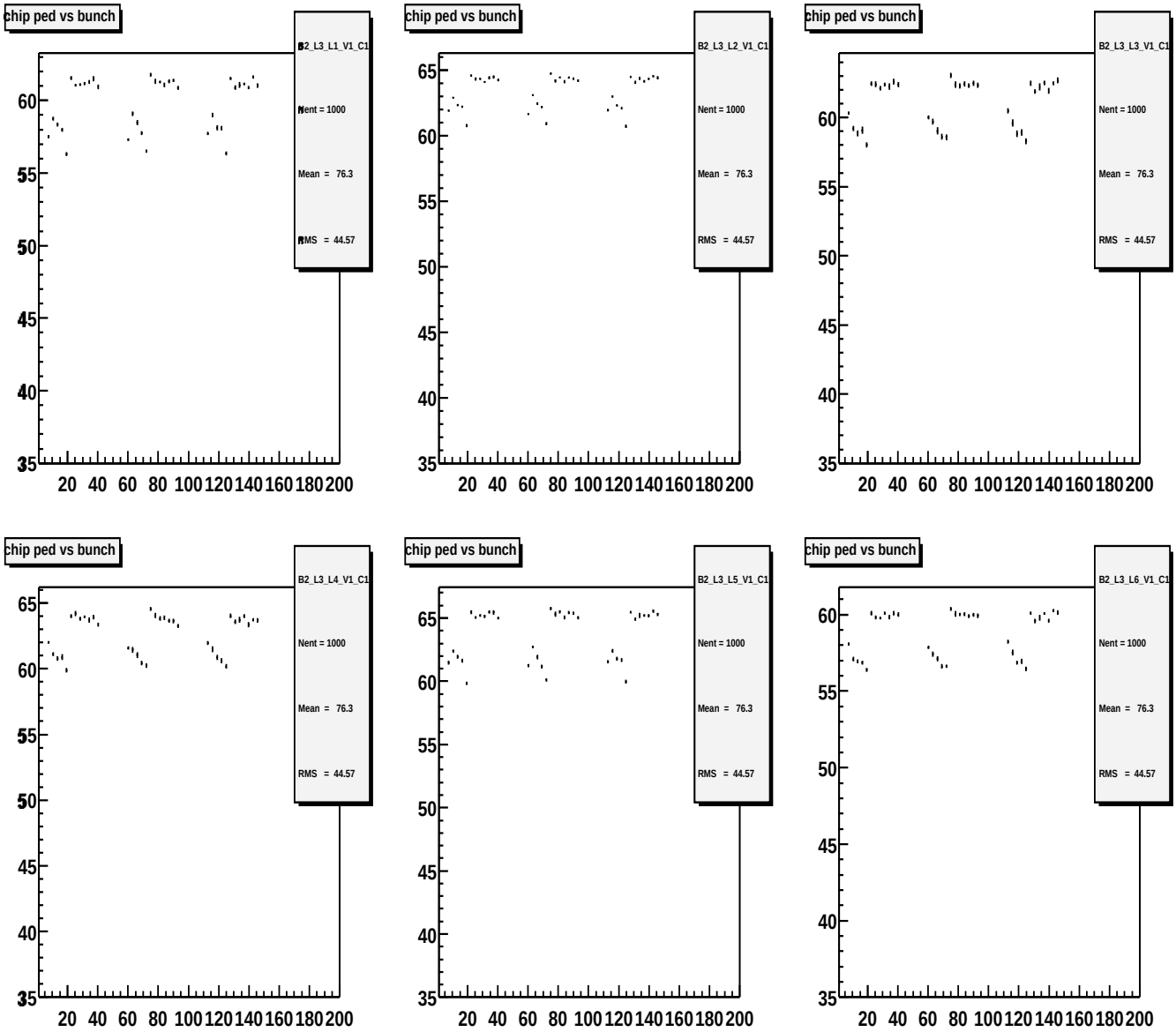
Pedestal versus Tick Number
Run 138387, 6 chippers, p-side



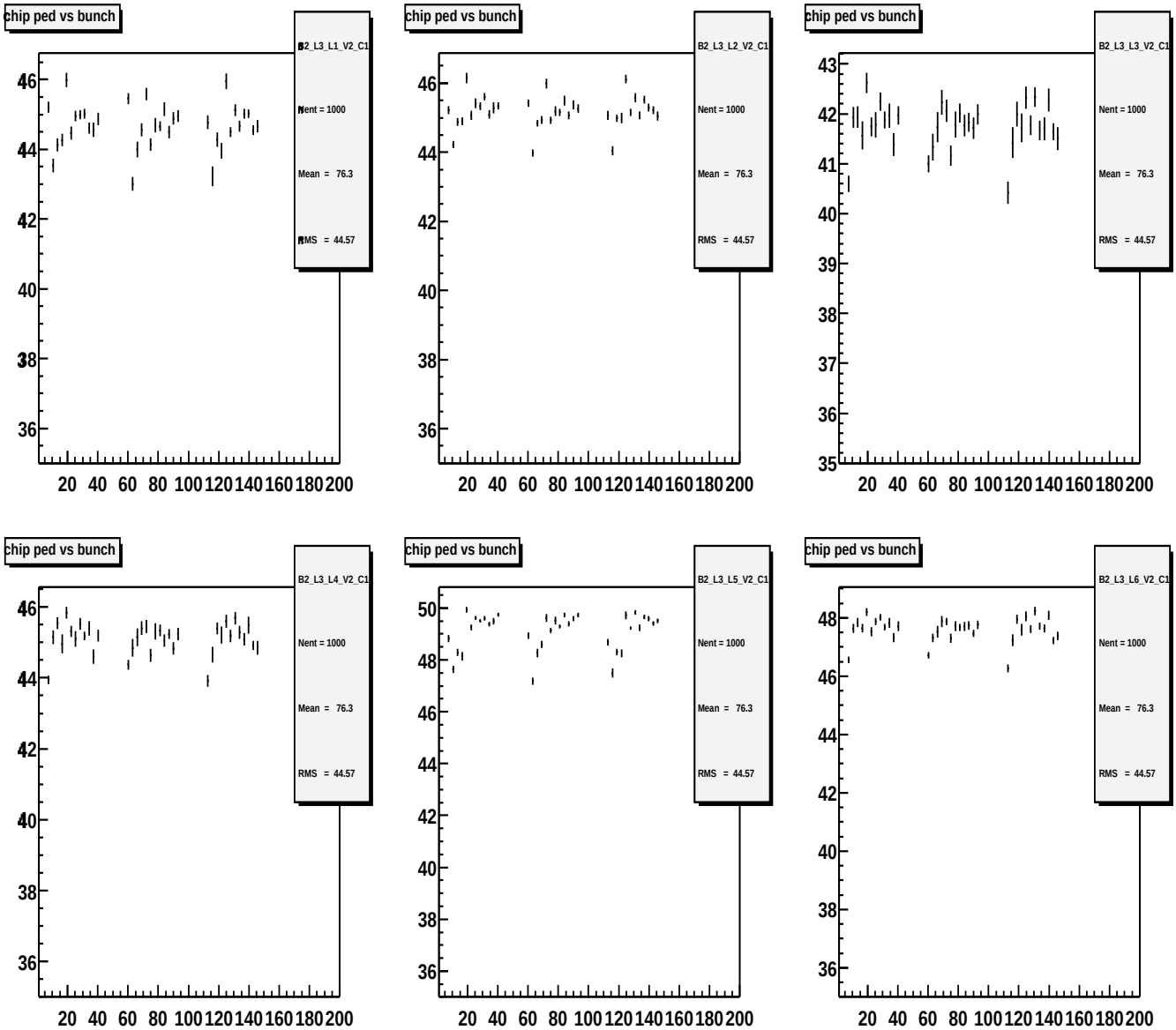
Pedestal versus Tick Number
Run 138387, 6 chippers, n-side



Pedestal versus Tick Number
Run 138387, 9 chippers, p-side

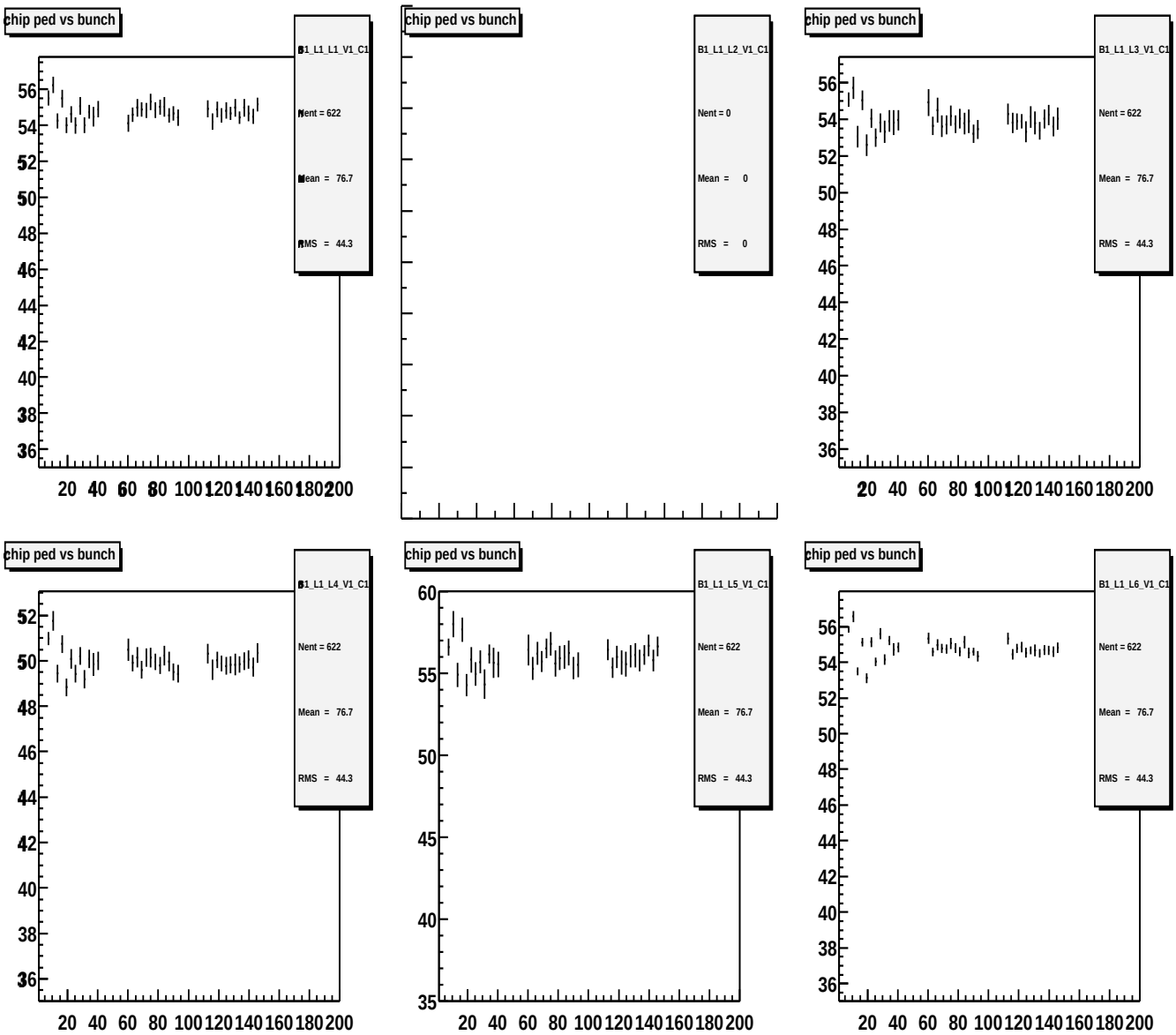


Pedestal versus Tick Number
Run 138387, 9 chippers, n-side

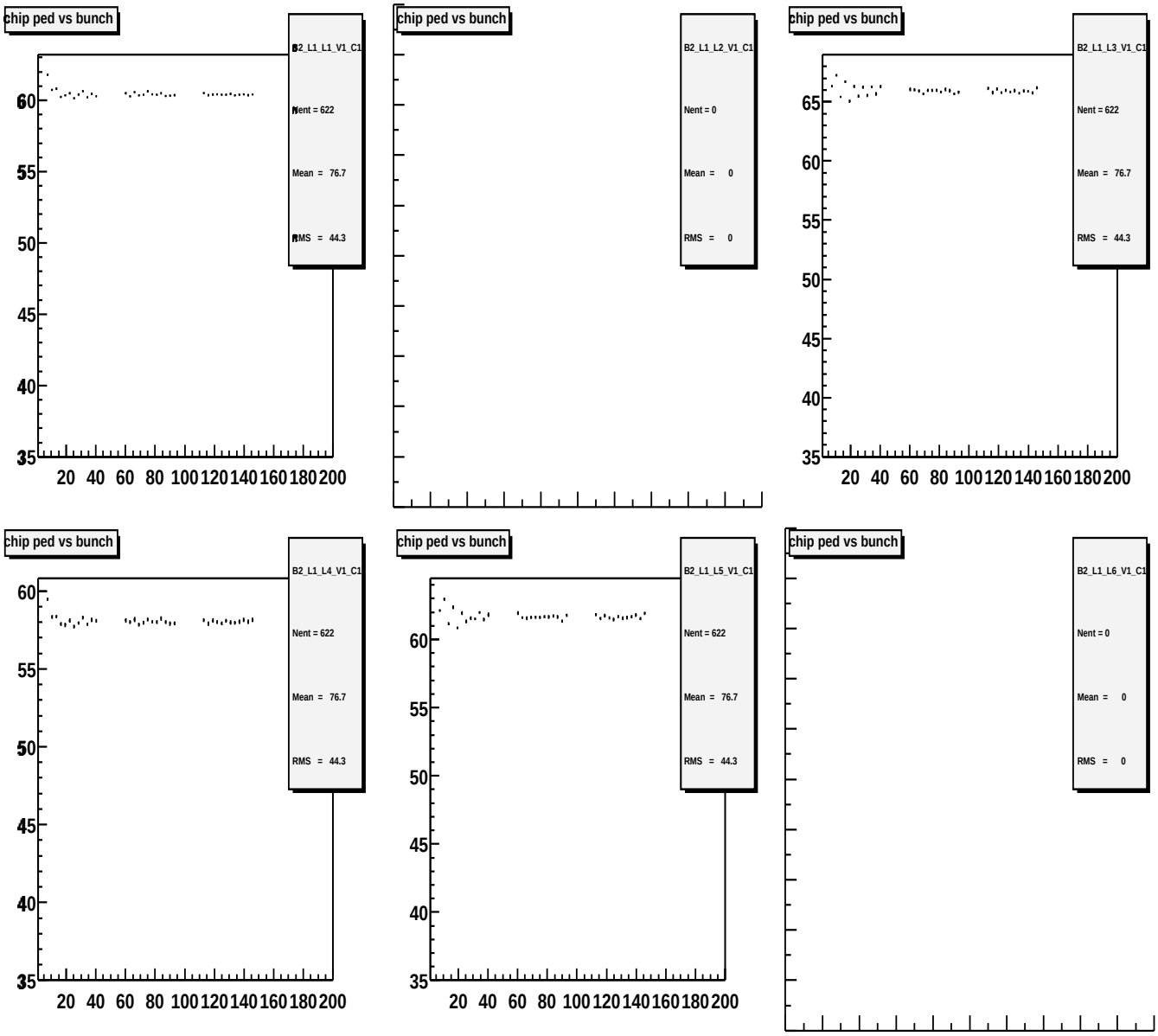


Pedestal versus Tick Number
Run 145771, 3 chippers

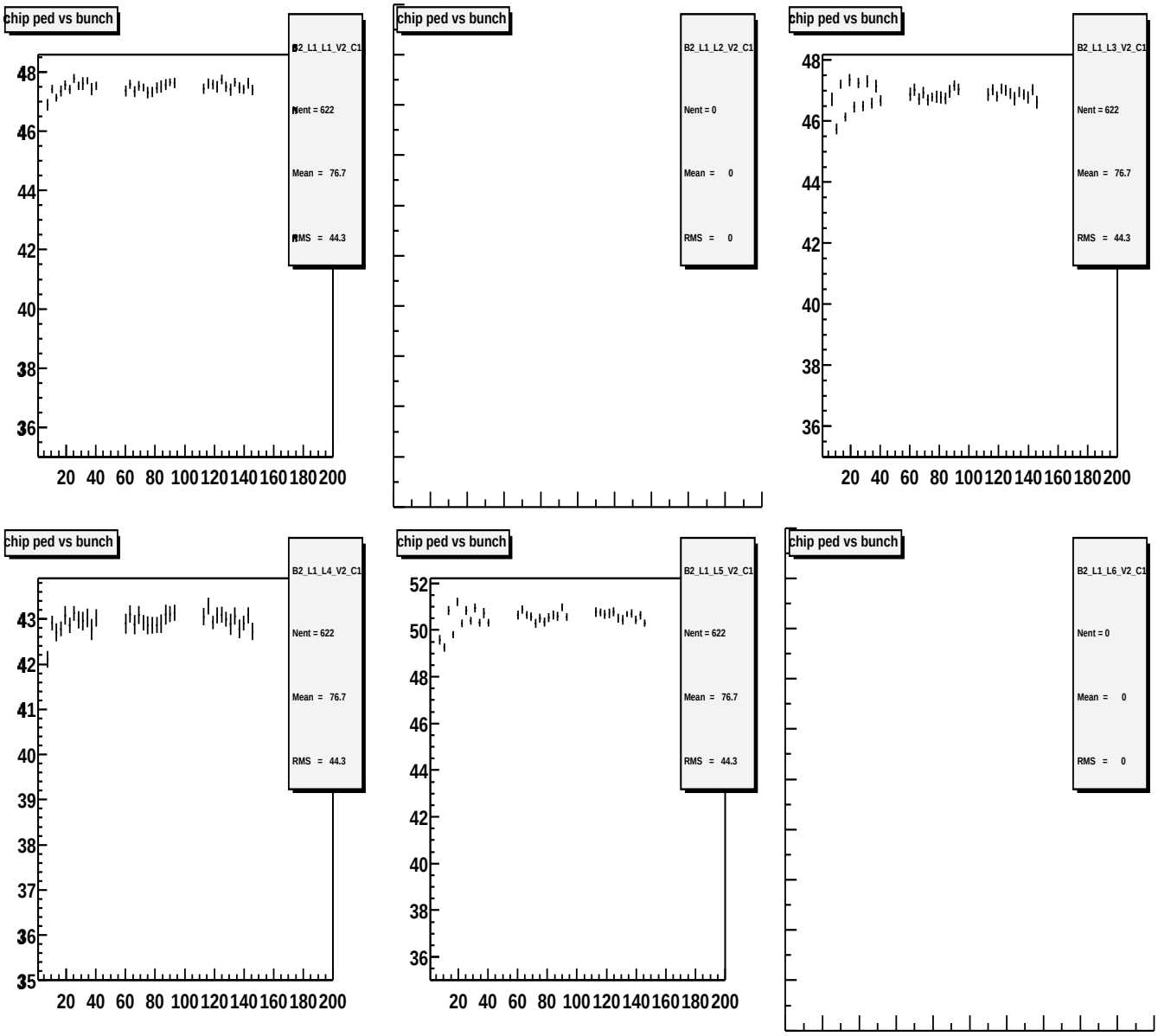
Flat/unflat distributions correlate with high/low common mode!



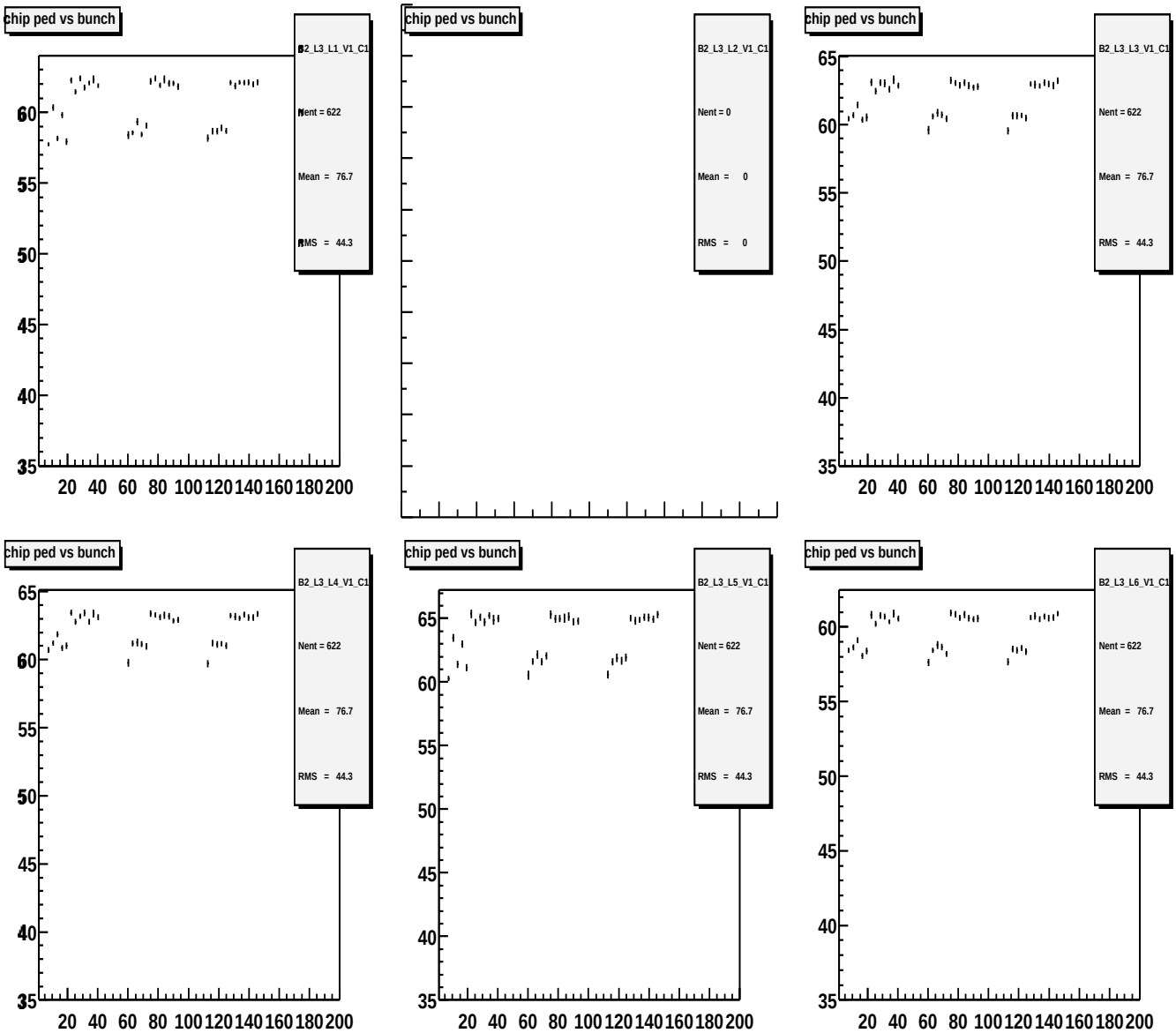
Pedestal versus Tick Number
Run 145771, 6 chippers, p-side



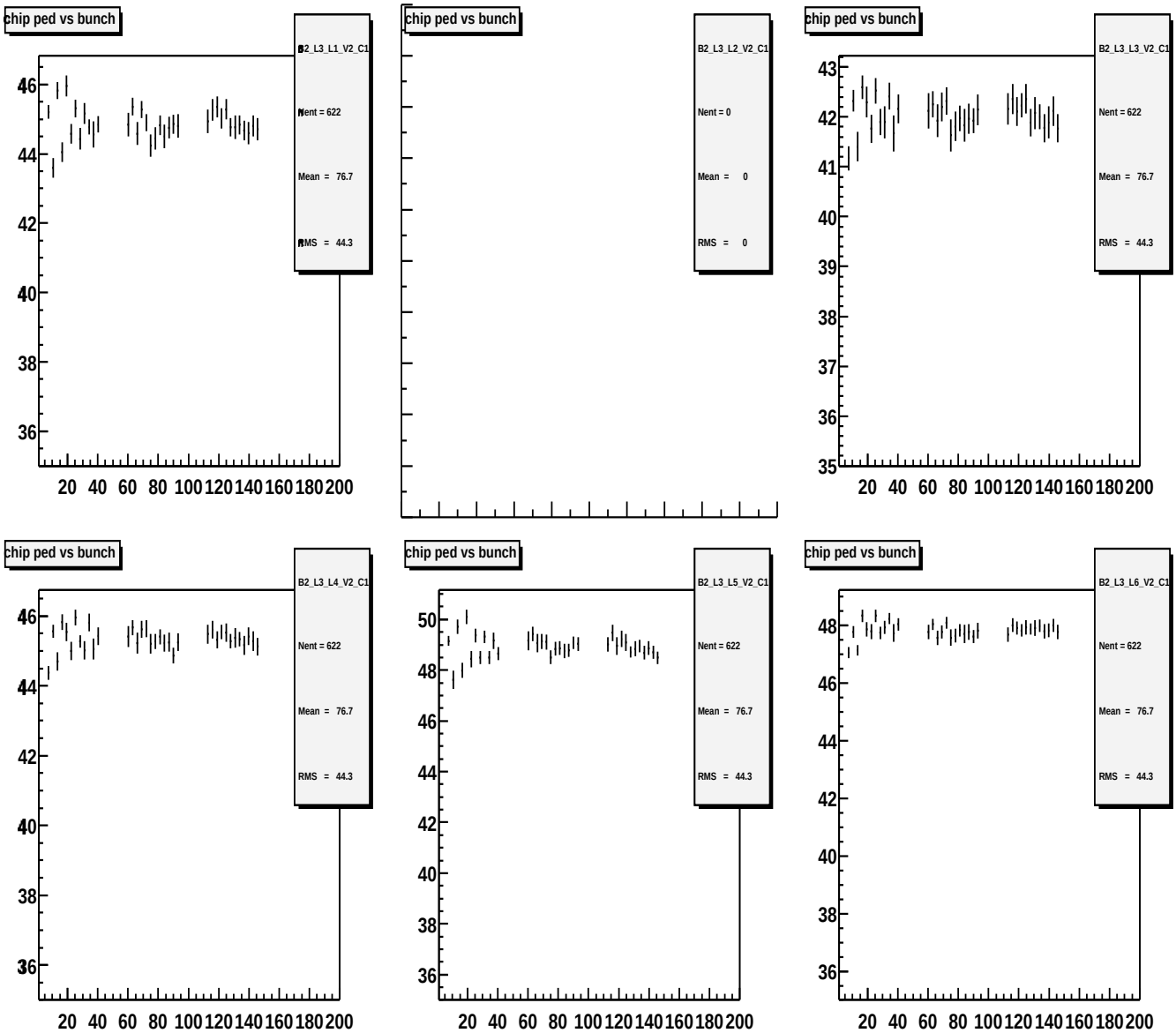
Pedestal versus Tick Number
Run 145771, 6 chippers, n-side



Pedestal versus Tick Number
Run 145771, 9 chippers, p-side



Pedestal versus Tick Number
Run 145771, 9 chippers, n-side



What's next...

After discussions with Aurelio, Breece, Eric and Harald:

We might be looking at 3 effects:

- Could the preamp reset in the first gap affect the first bunch crossing in the superbunch?
- Could the change in clock frequency after the fourth bunch crossing of each superbunch could cause the observed structures in pedestal vs tick number?
- Some 'smearing' of the pedestal vs tick number distributions due to the fact that I do not remove noisy strips.

To investigate further the problem:

- During access of April 16:
  1. move the preamp reset to the second gap to see effect on pedestal vs tick number in PDAQ runs,
  2. shift the read out timing compare to the clock and see effects in PDAQ runs.
- In addition we should take SDAQ runs with a specified tick number and vary it.
- The pedestal versus tick number distributions should be remade once the noisy strips have been removed.