Results of the LP-TPC laser system tests

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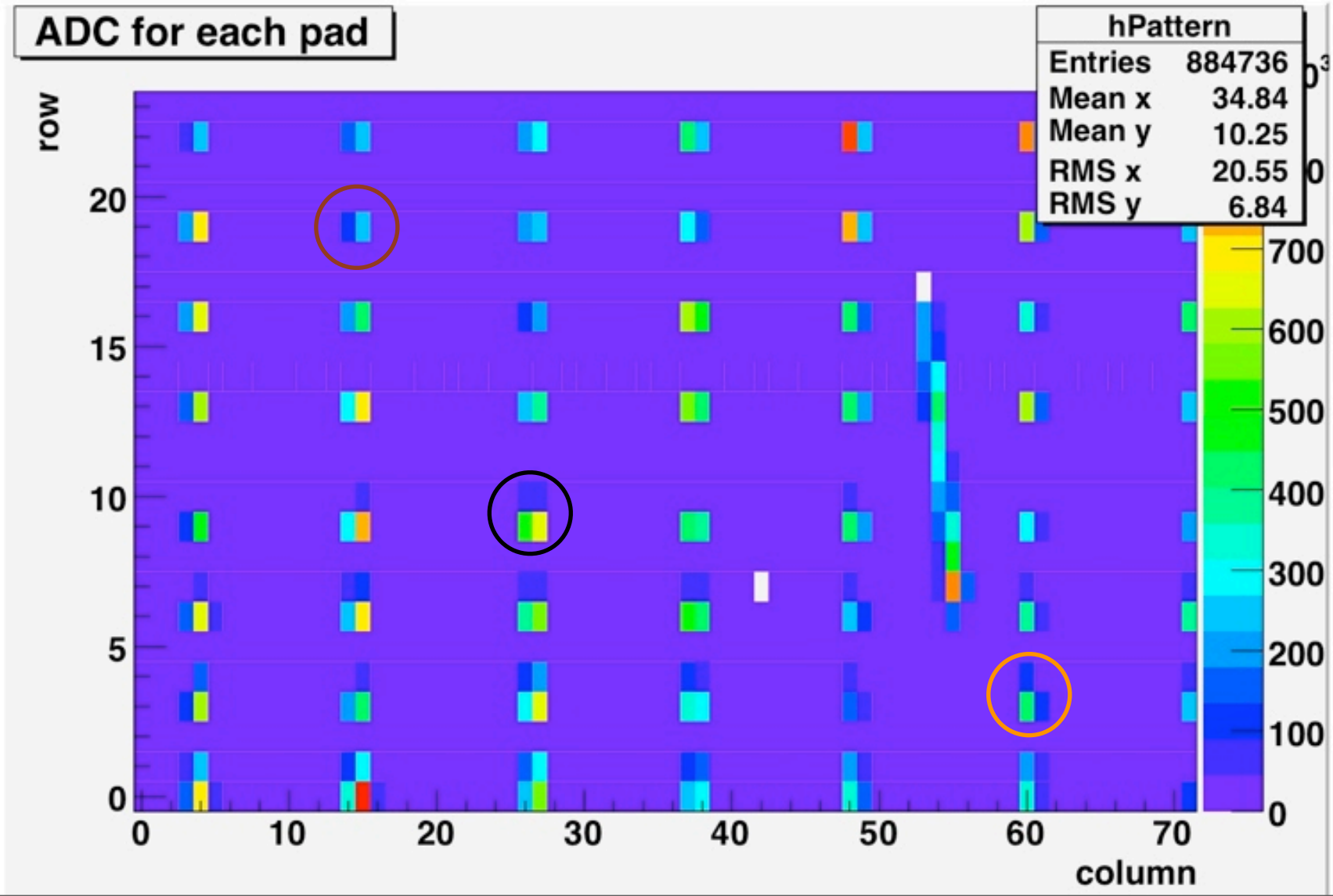
Data taken

- Runs at several laser power settings (6 through 8)
- Long runs at different TPC z-positions to serve as test data for reconstruction code
- Runs with and without magnetic field
- Unsuccessful runs to measure E inhomogeneities
- Brief runs to test issues arising from magnetic field

Observing distortions from B inhomogeneities

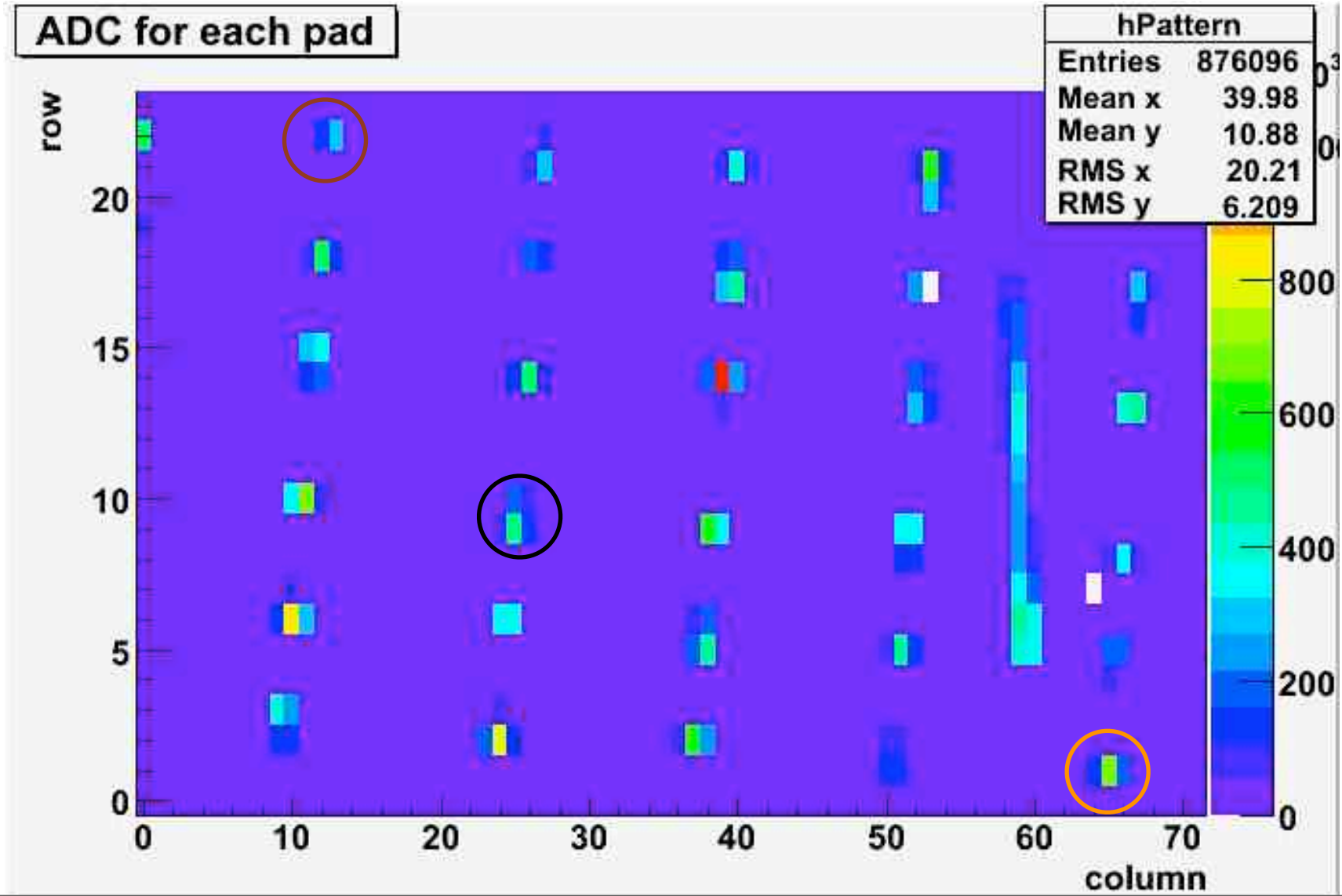
- z=15cm position (homogeneous field) (total of 500 events)



Run 638

Observing distortions from B inhomogeneities

- z=50cm position (inhomogeneous field) (total of 500 events)



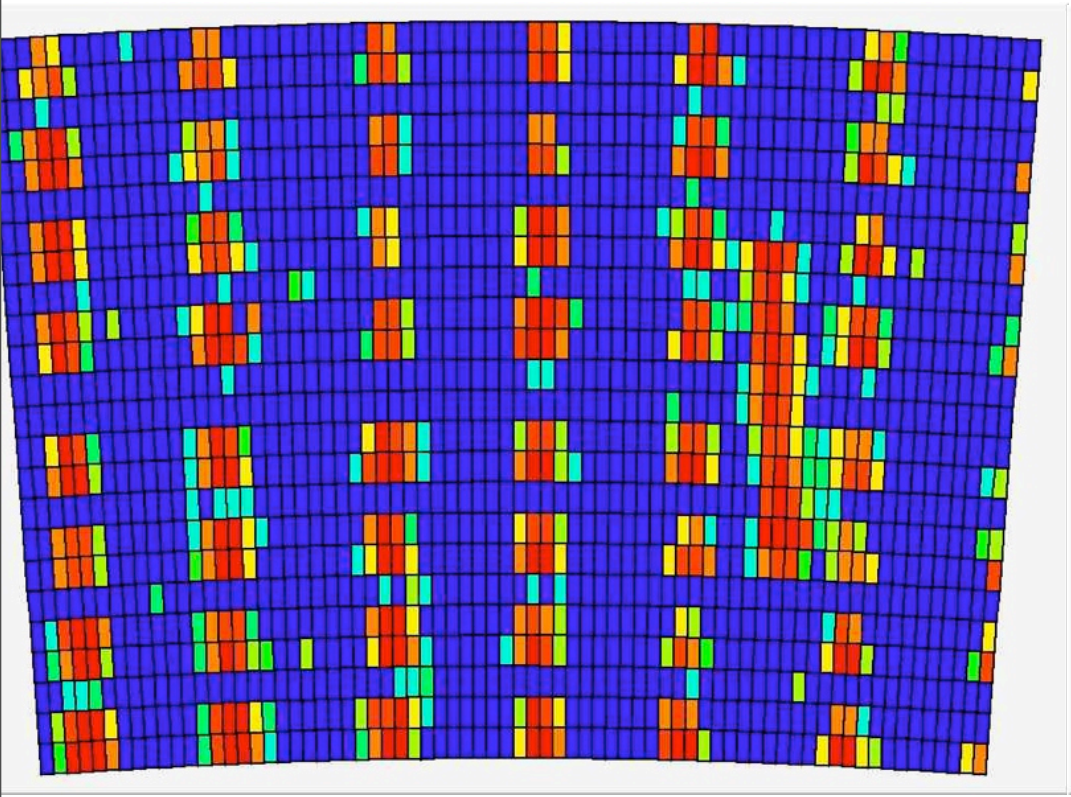
Run 636

Stray B-field effects on laser system

- Solenoids in the manual beam-blocker are very sensitive to field
  - Possibly easiest to remove the beam-blocker entirely
- Electrons counts are dependent on the strength of field
  - No B-dependence has been seen with testbeam
- Laser will not operate in high magnetic field (interlock trips)

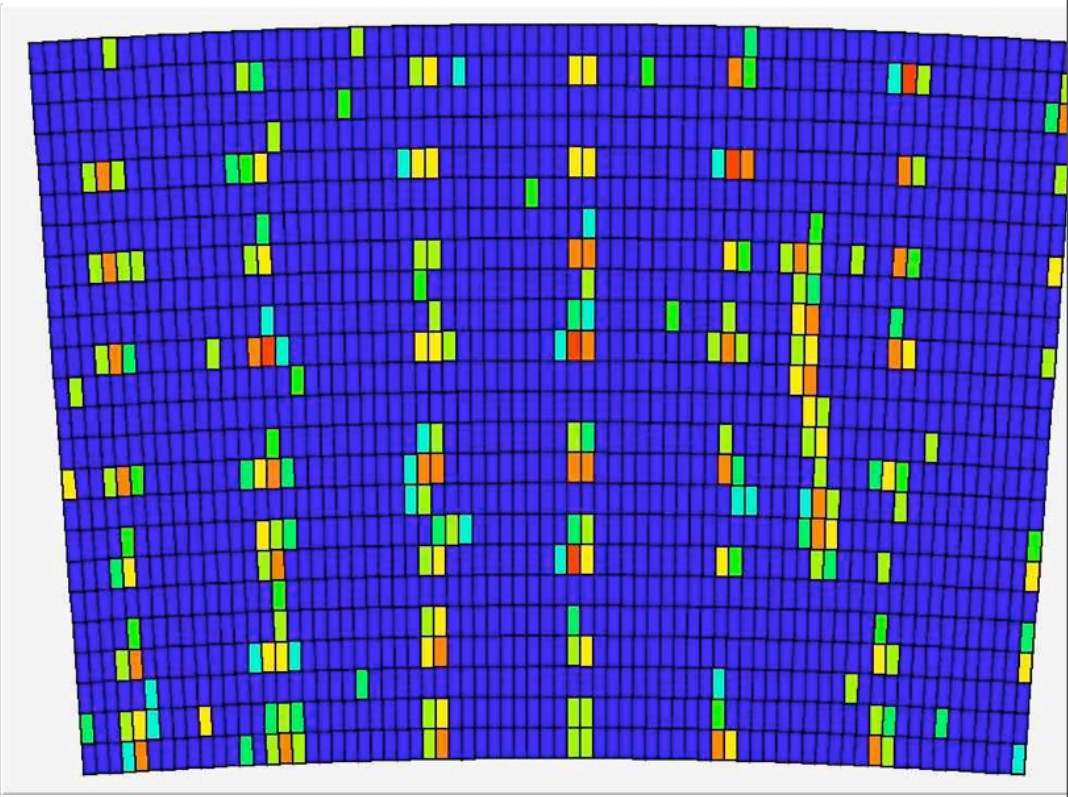
Electron counts vs. field strength

0T field



Run 639

1T field

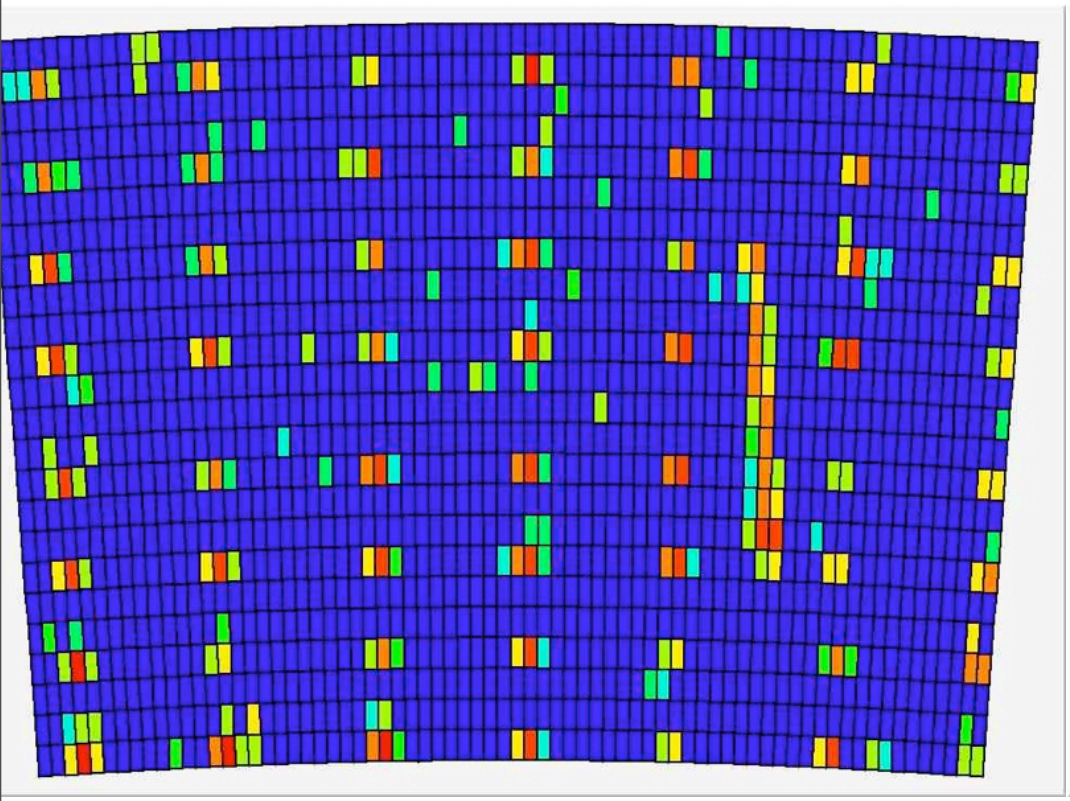


Run 638

- Conditions otherwise constant
- Laser power 8

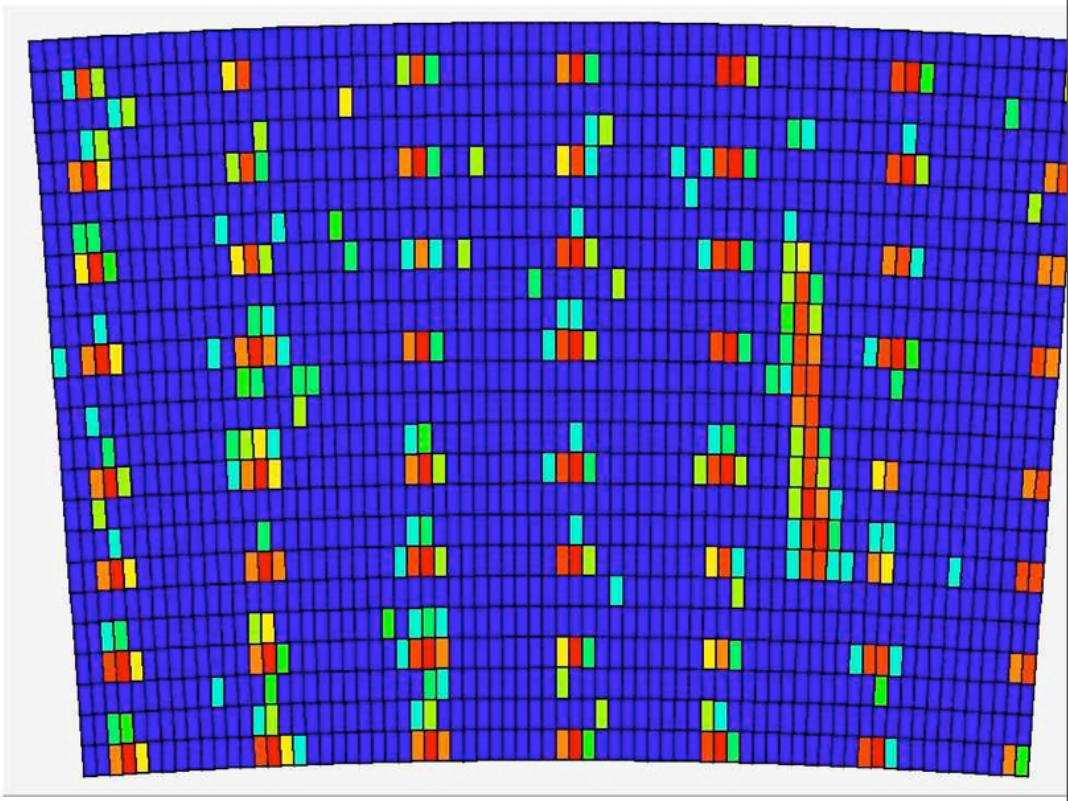
Electron count dependence on laser power supply position

High field area



Run 651

Low field area

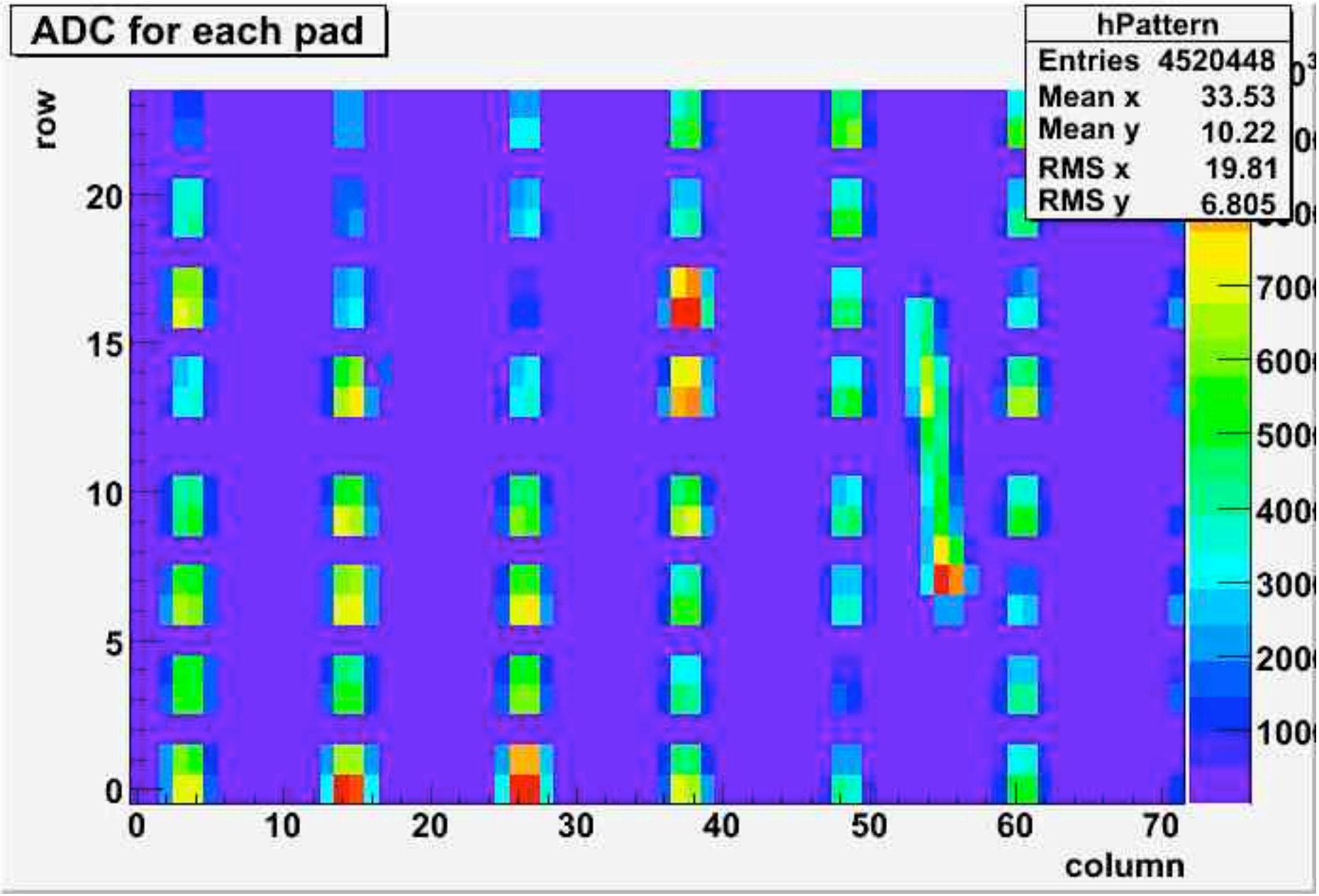


Run 652

Future runs

- Runs should be taken with individual beams to check if their energies are similar (ADC counts of long runs suggest upper beam might have slightly less)
- More testing should be done to see if 0T/1T intensity difference is entirely due to power supply, and how to maximize output.

Long-term intensity map



Run 643