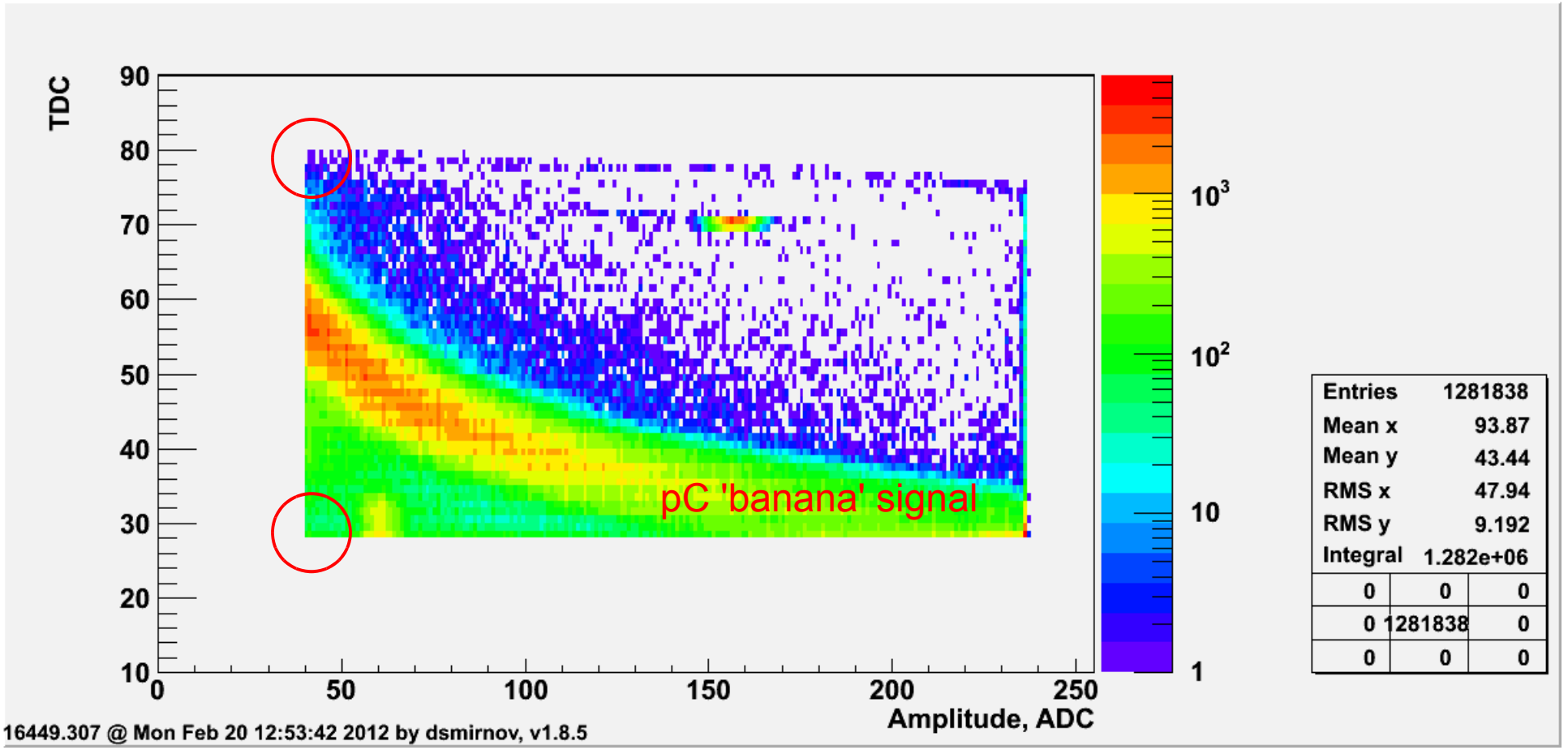
pC polarim.: noisy data

Time mtg.
21.02.12

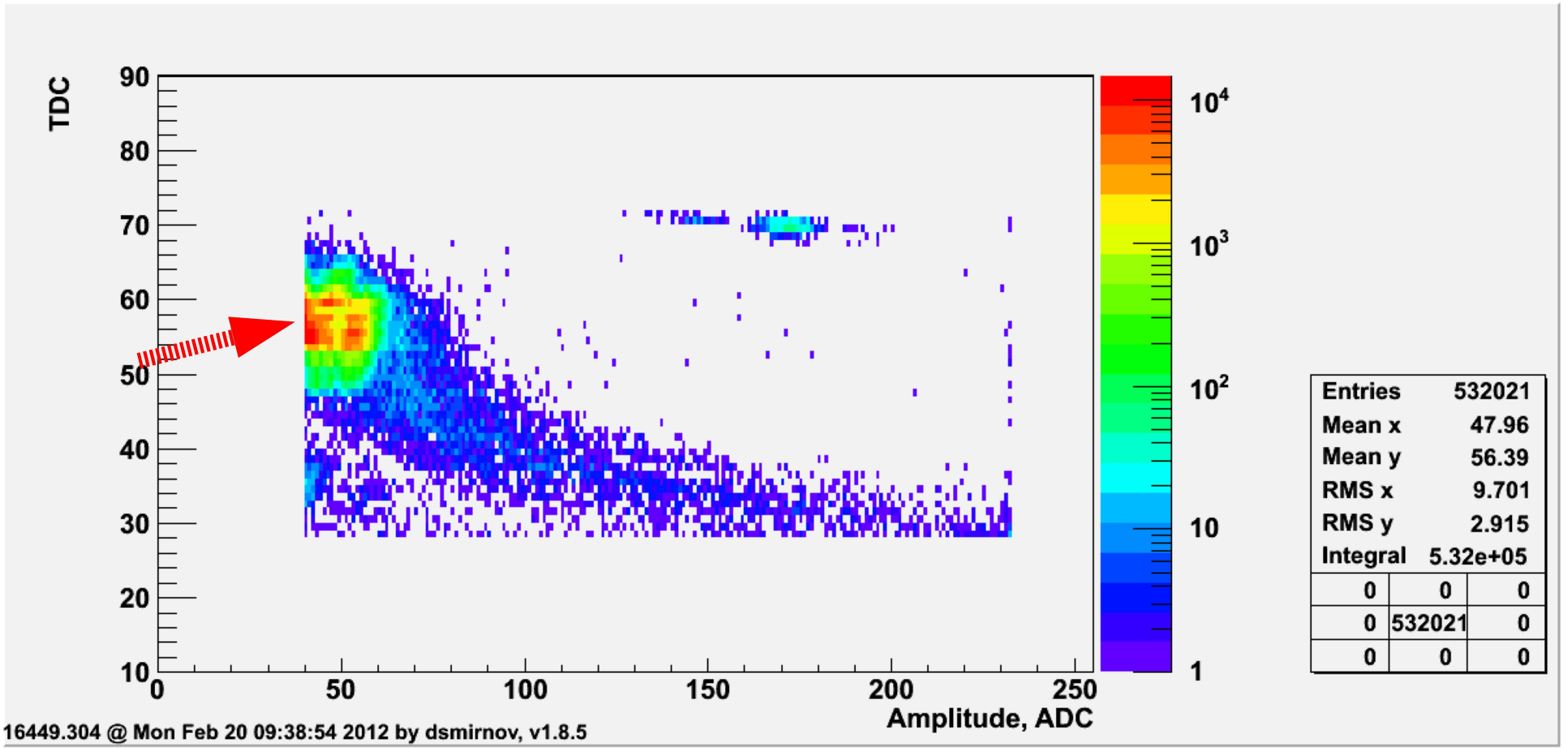
- 1st a good measurement
- Measure TOF vs. Ekin. for scattered ^{12}C nuclei, single channel:



- Always have beam pulse near corners ◯ in time with p-bunch
- Not near signal; controlled with amplitude, time cuts,

New in 2012

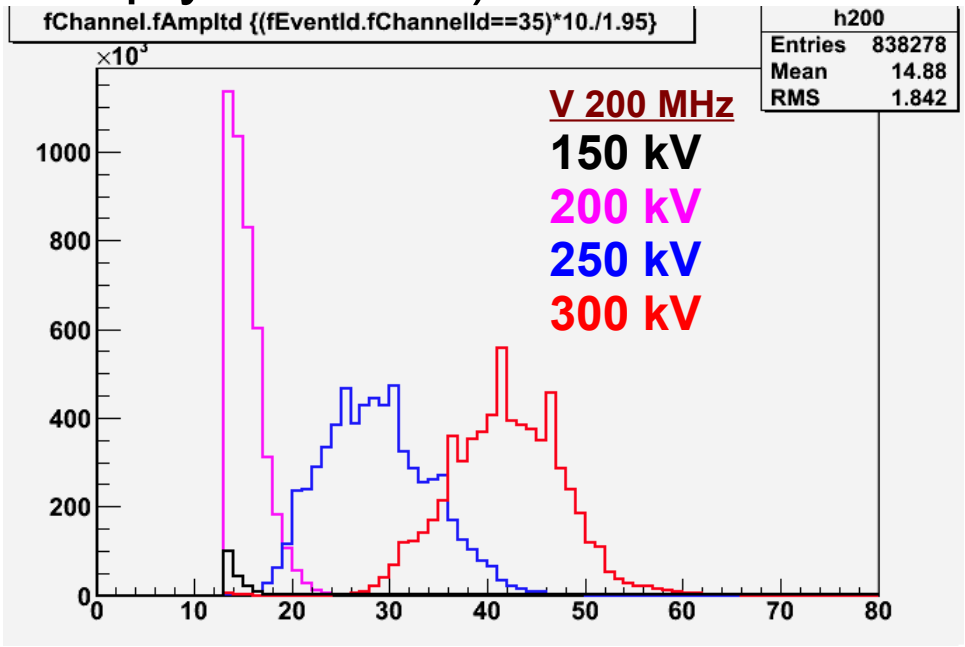
- Now same channel, noisy measurement:



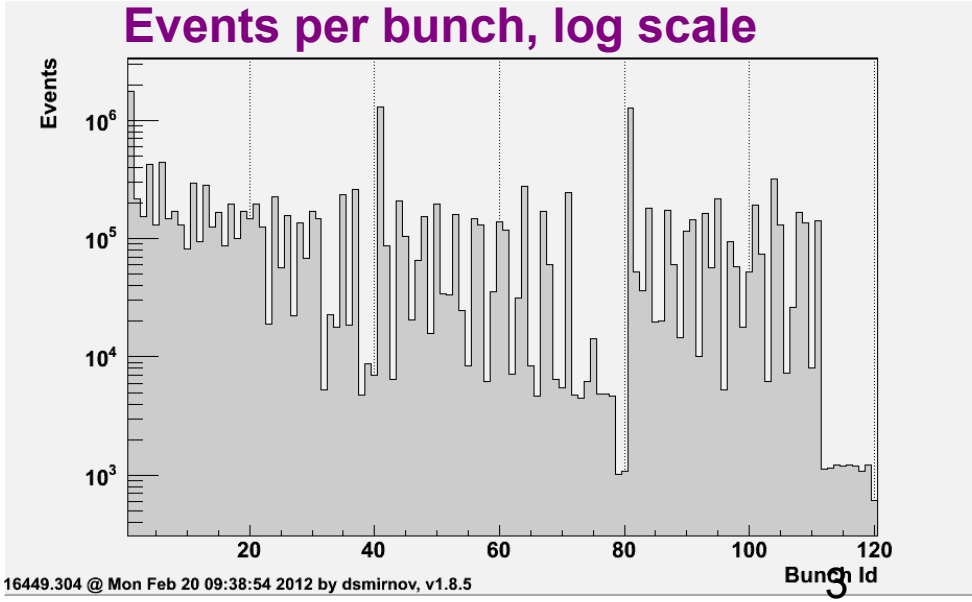
- Low-ish amplitude pulse, mid-way between p-bunches
- Sits near or right on top of ^{12}C signal: background to P measure

Noise characteristics

- Associated with p-bunches (i.e. not in empty bunches) at worst @ ~ 10 MHz, every bunch
- At 100 GeV associated with 200 MHz, amplitude∝cavity voltage:



- Amplitude increases with bunch current
- Varying per-bunch currents give varying per-bunch noise; depending on +/- spin fill pattern can give large false +/- asymmetry



- Almost all problems in Yellow; last days hints in Blue
- Which channels afflicted varies considerably; some usual suspects

Next steps & outlook

Online results:

- Clean up each measurement: eliminate noisy channels, detectors
- Provide sensible P value useful for operations

Offline (physics) results:

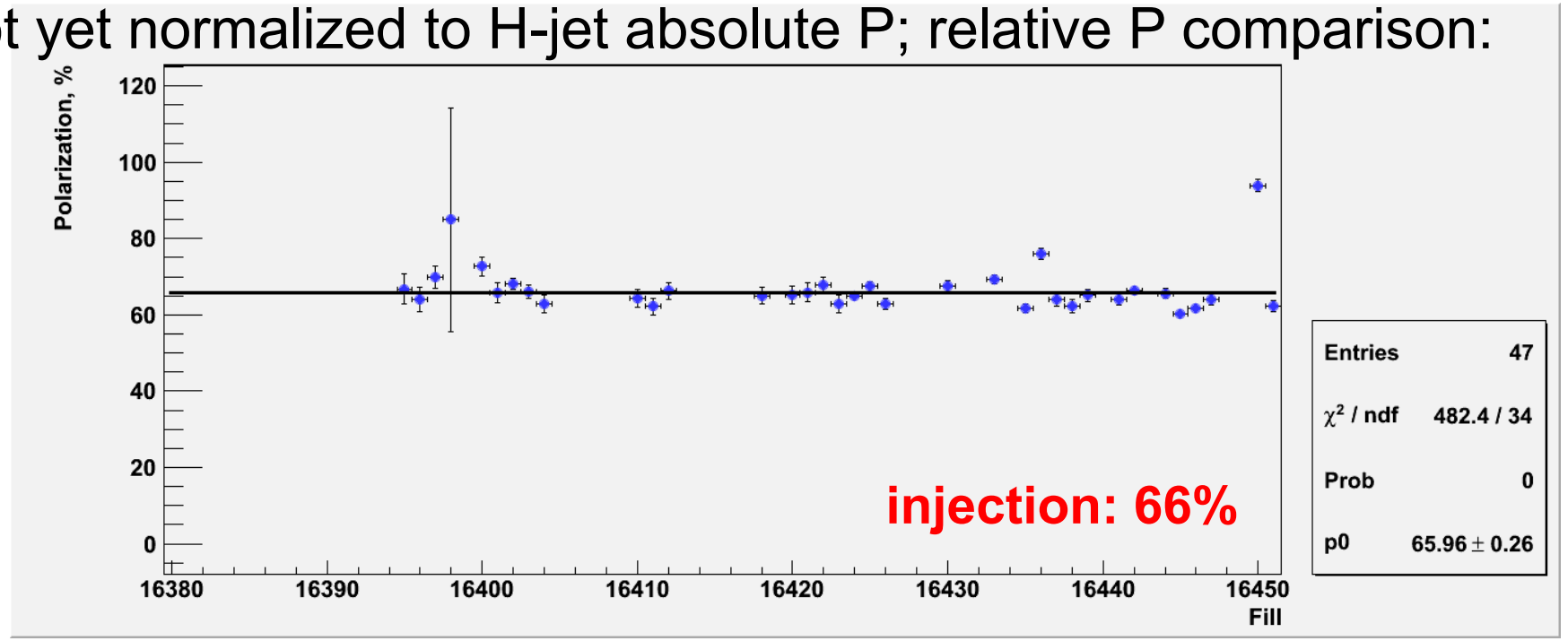
- Similar data cleanup, improve
- 1st concern:
  - signal on top of varying noise pulse distorts ^{12}C E-measurement
  - P measurement depends critically on ^{12}C E-range
  - new systematic, needs study
- Provide best possible P values, perhaps statistically compromised

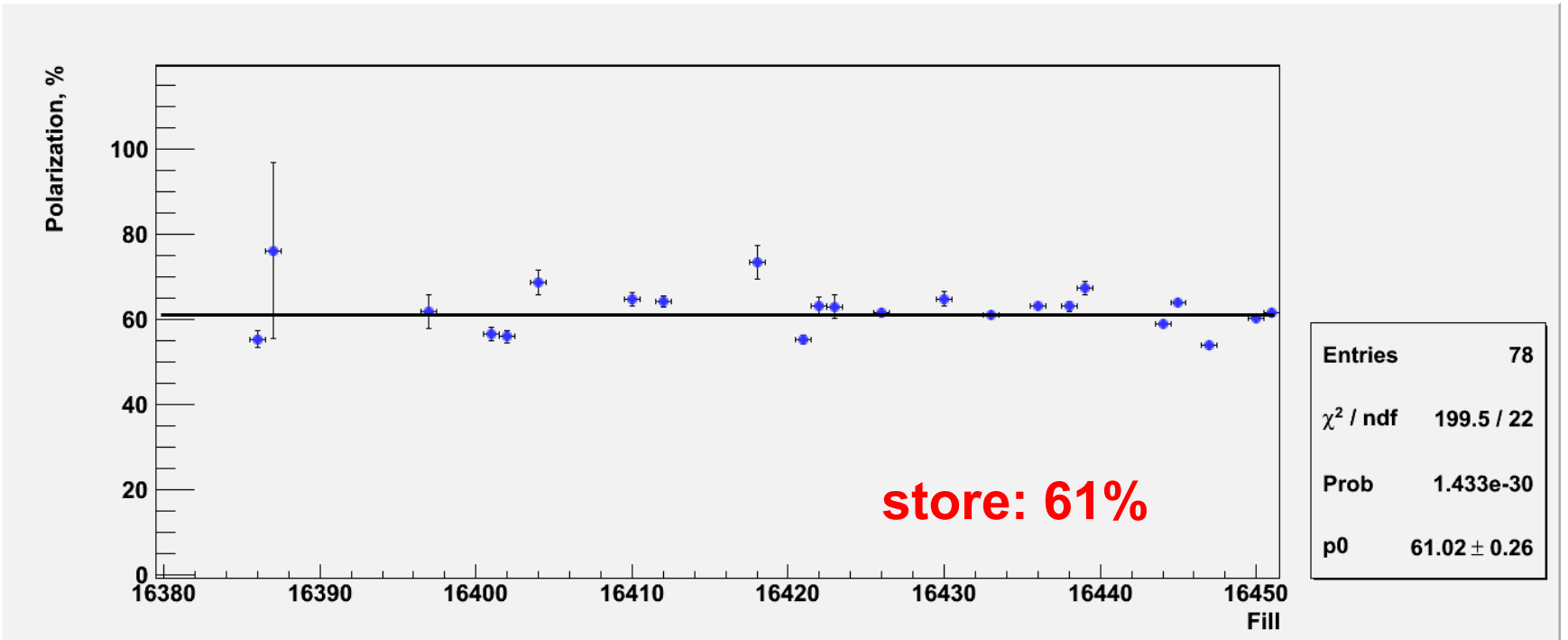
Important:

- **Offline, noisy data can almost always be repaired**
- **Please continue regular polarization measurements even if online looks bad**

pC P vs. fill: inj. & store

- Not yet normalized to H-jet absolute P; relative P comparison:





P lifetime @ store: Blu & Yel

- Not yet normalized to H-jet absolute P; relative P comparison: