

MIP Calibration

Update 2

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HELMHOLTZ RESEARCH FOR
GRAND CHALLENGES



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ZUKUNFT
SEIT 1386



Outline ToDo list

- Mean/RMS distributions for memcell offsets:
 - Channelswise, memcell 0-10
 - Chipwise, memcell 0 only, memcell 1 only, etc.
- For individual memcell 0,1,2 same channels, pedestal value difference:
 - Two runs (short time scale and long time scale)
 - Two runs (May vs. June and PP vs. no PP)
- Implement MIP - Pedestal in MIP extraction
- Quality tests, Outliers etc. output pedestal (first) and MIP lists
- Compare μ runs PP vs no PP, higher statistics
- MIP/Pedestal T-check

1.



2.



3.

4.

5.

6.

Pedestal Difference Individual Memcell

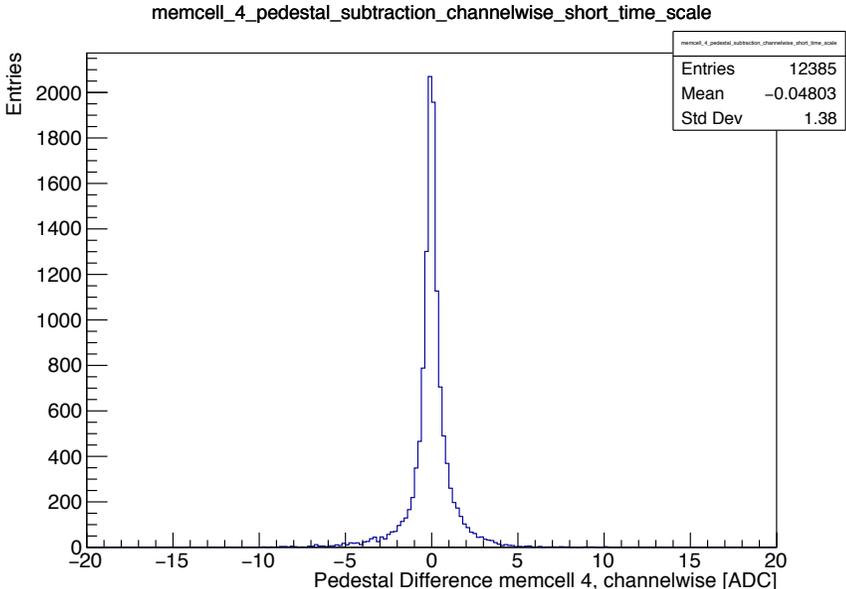
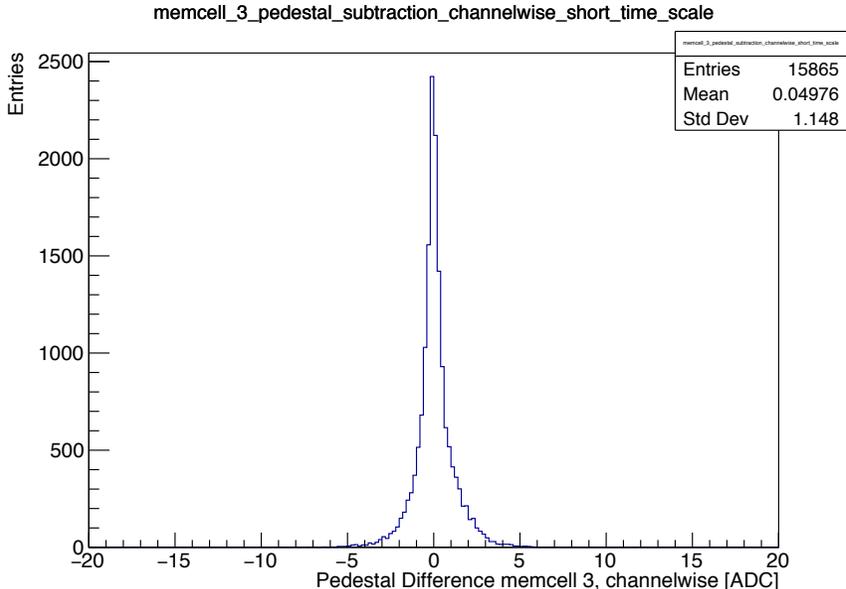
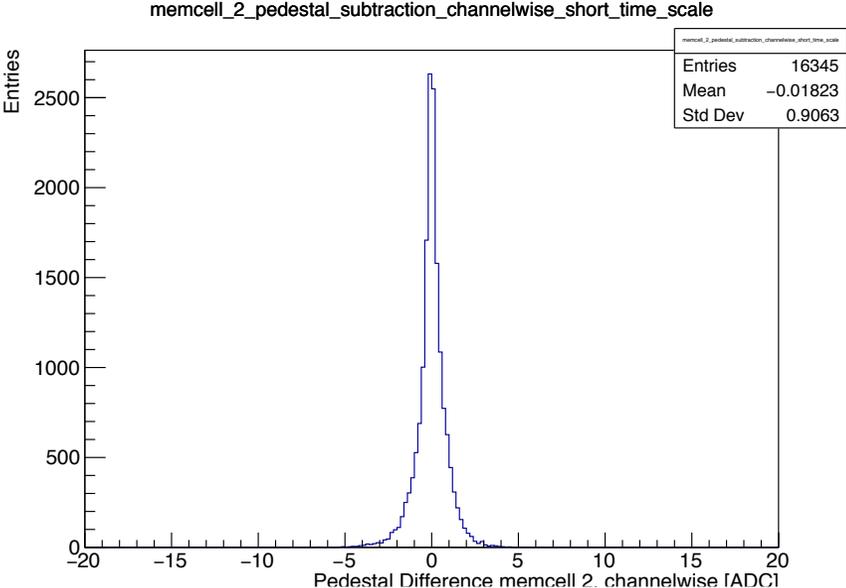
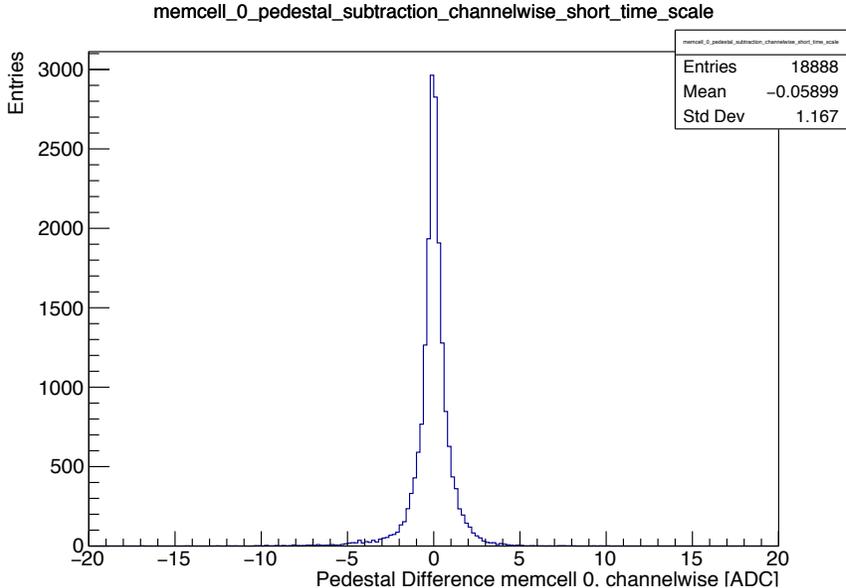
Cross-checks pedestals of memcells - Run comparison

First: Continue pedestal cross-checks and distributions. Steering and pedestal extraction of individual runs, compare pedestal values:

- ➔ Plot the absolute pedestal difference [ADC] between the same memcells (0,2,3,4) for channels overlapping in two different runs and passing statistics condition
 - ➔ Runs took right after another (short time scale)
 - ➔ Runs took at beginning and end of test beam (long time scale)
 - ➔ Same testbeam: no PP vs. PP
 - ➔ Different testbeam: May and June 2018

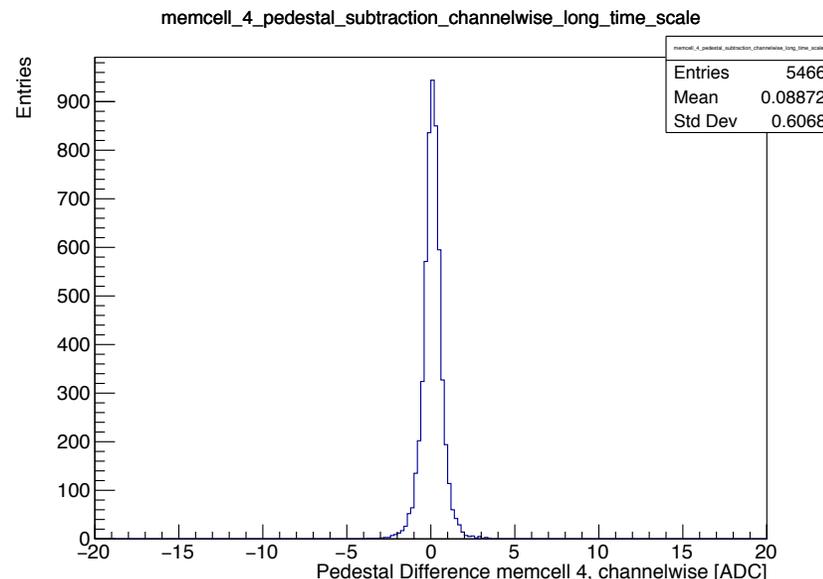
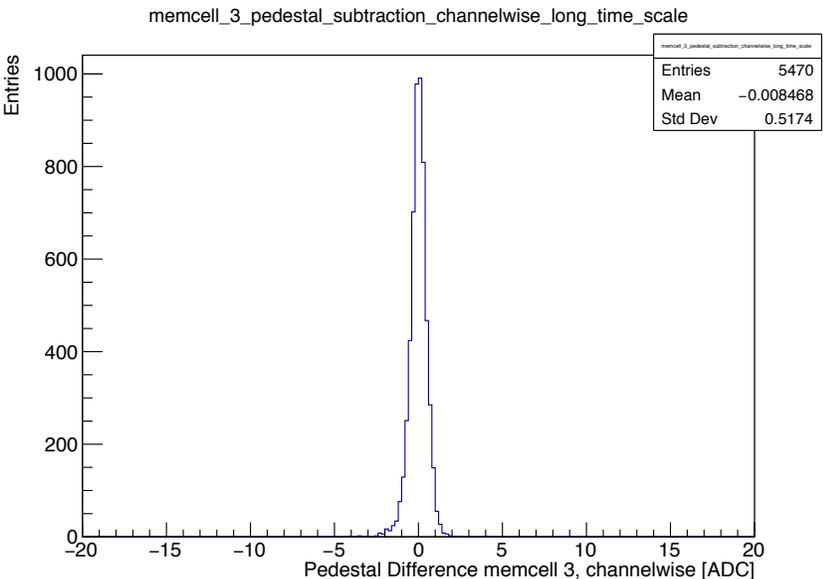
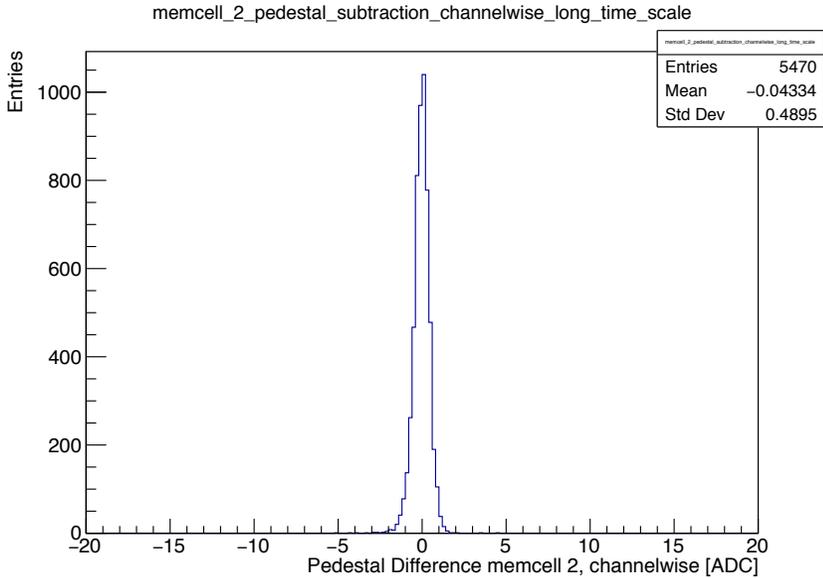
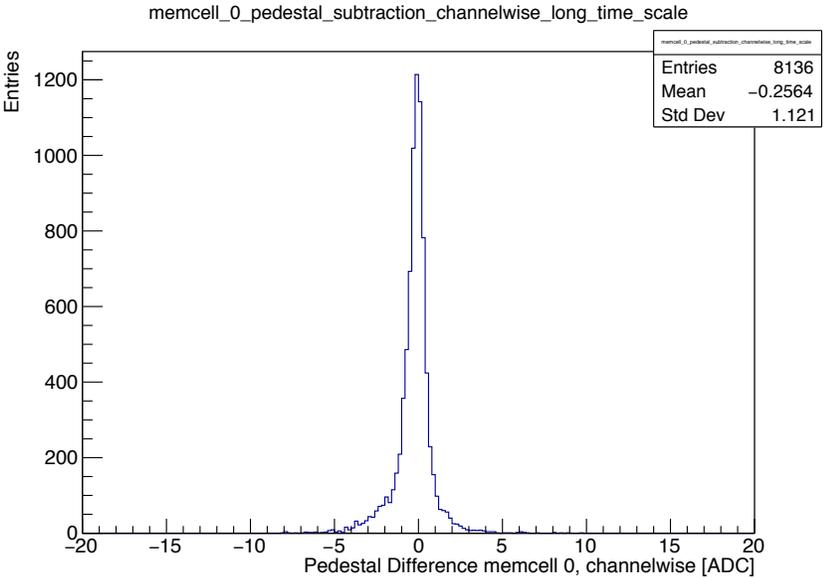
Pedestal Difference Individual Memcell

Short time: Mav testbeam. no PP. 40GeV muons, Run 60307 vs Run 60308



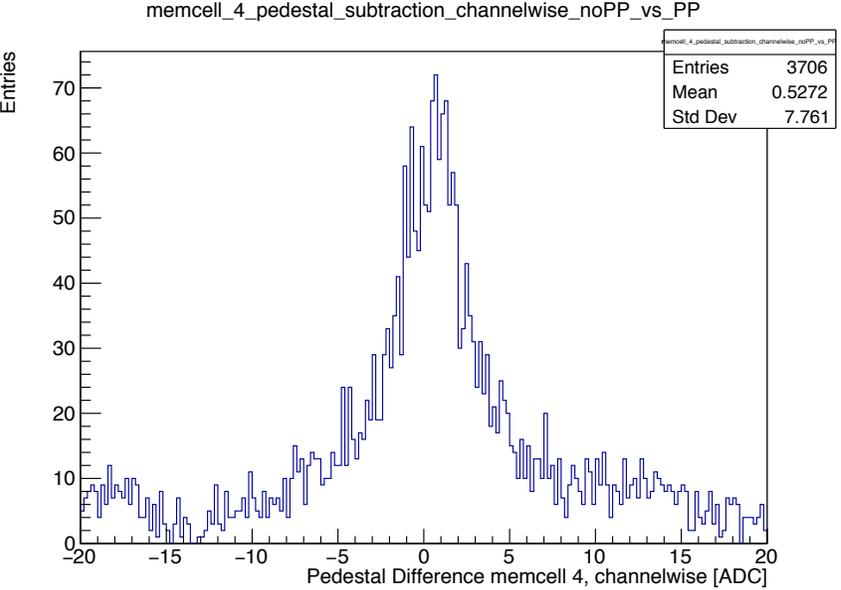
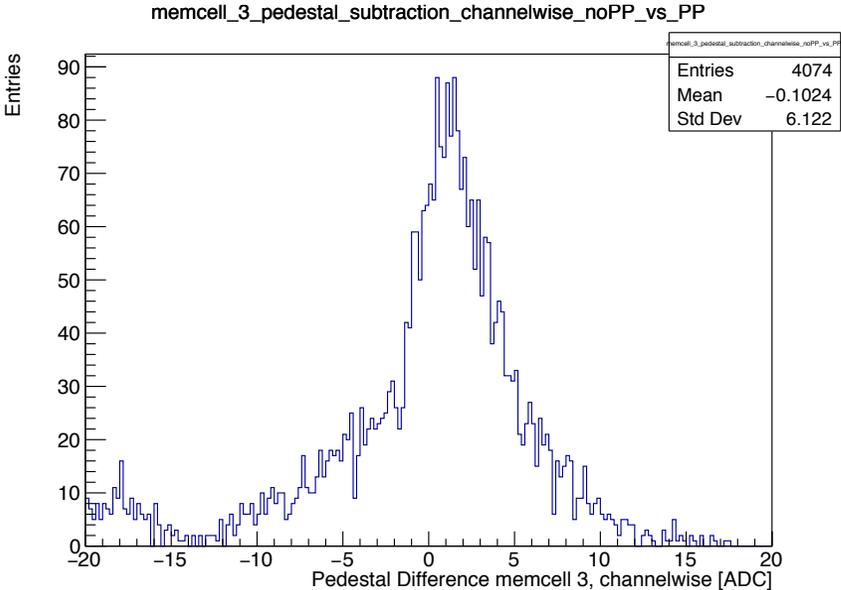
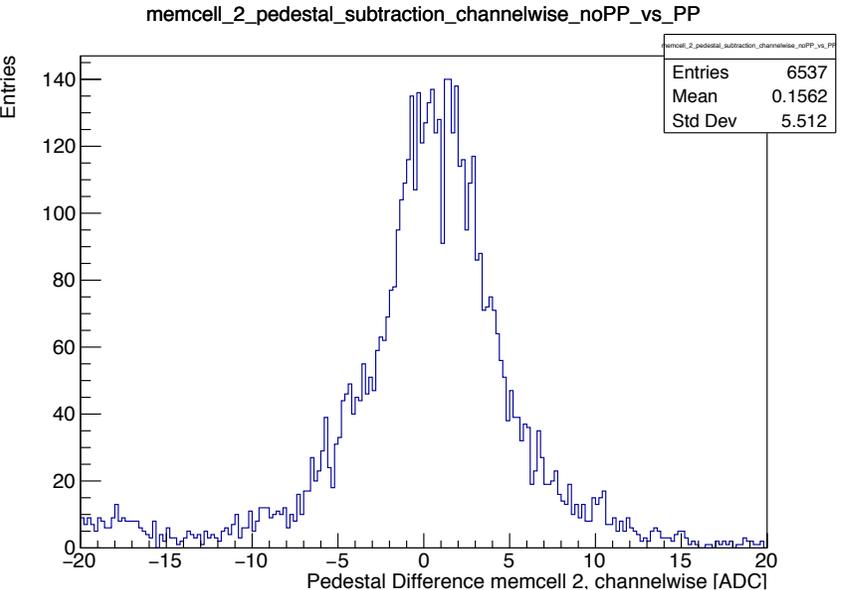
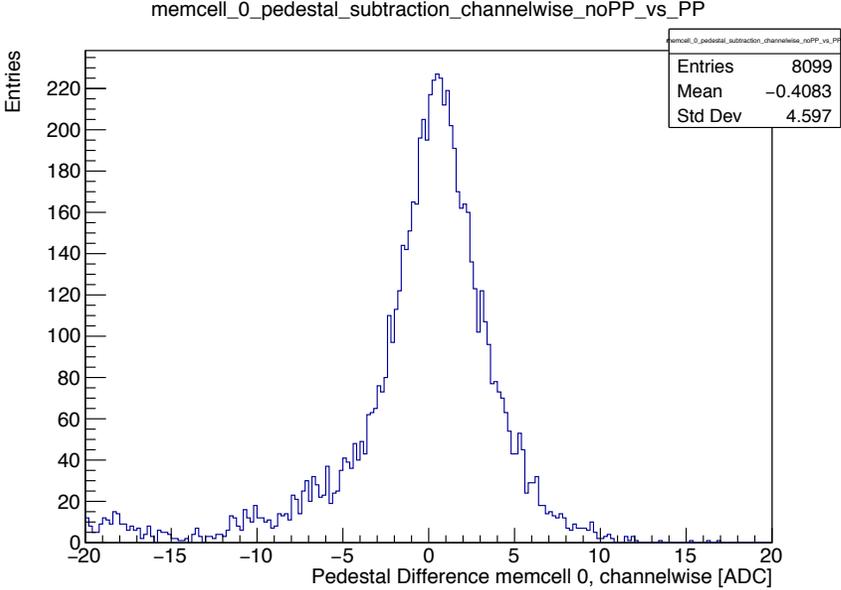
Pedestal Difference Individual Memcell

Long time: May testbeam, no PP, 40GeV muons, Run 60263 vs Run 60943



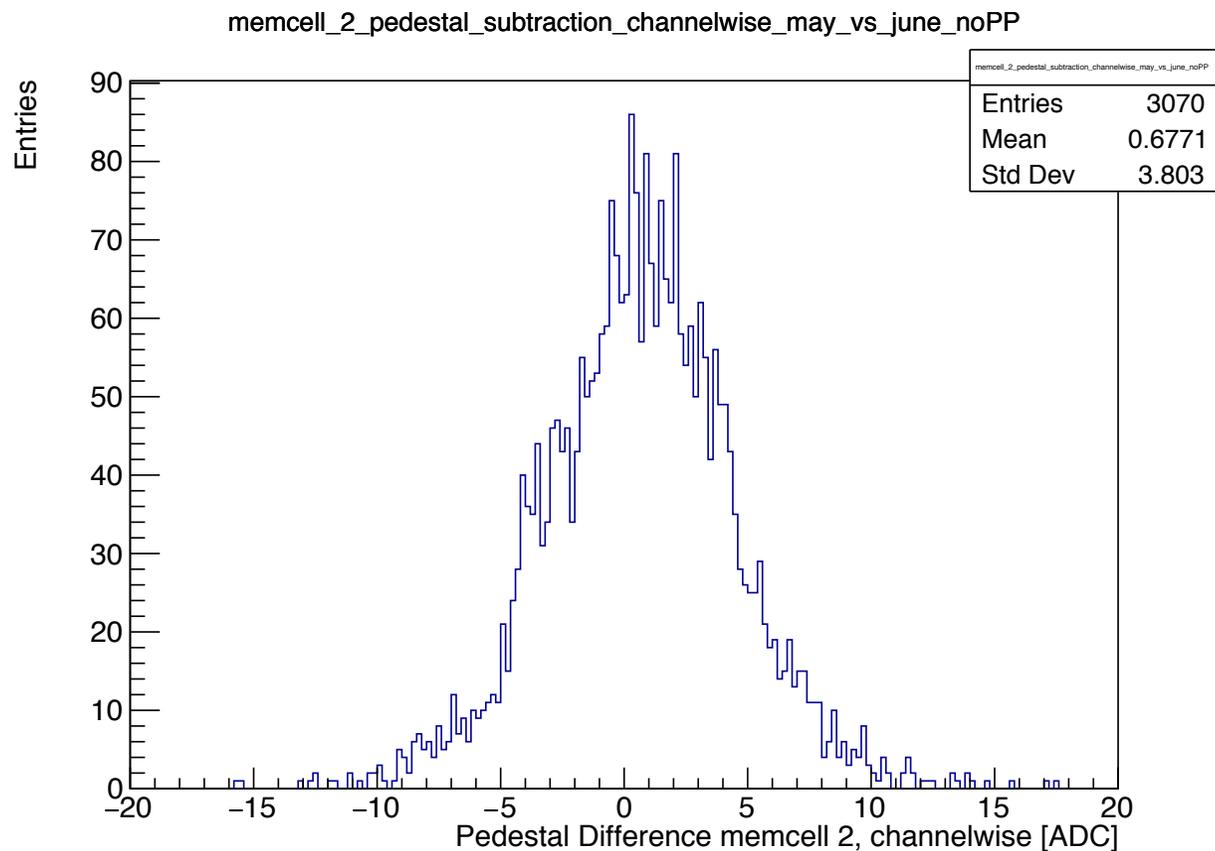
Pedestal Difference Individual Memcell

PP vs. no PP: Mav testbeam. 40GeV muons. Run 60247 (no PP) vs Run 60350 (PP)



Pedestal Difference Individual Memcell

May vs. June: 40GeV muons, no PP, Run 61122 vs Run 60961



For other memory cells not a single entry in histogram:

- ➔ Check runs, cuts
- ➔ Check pedestal extraction for June
- ➔ Check selection code...

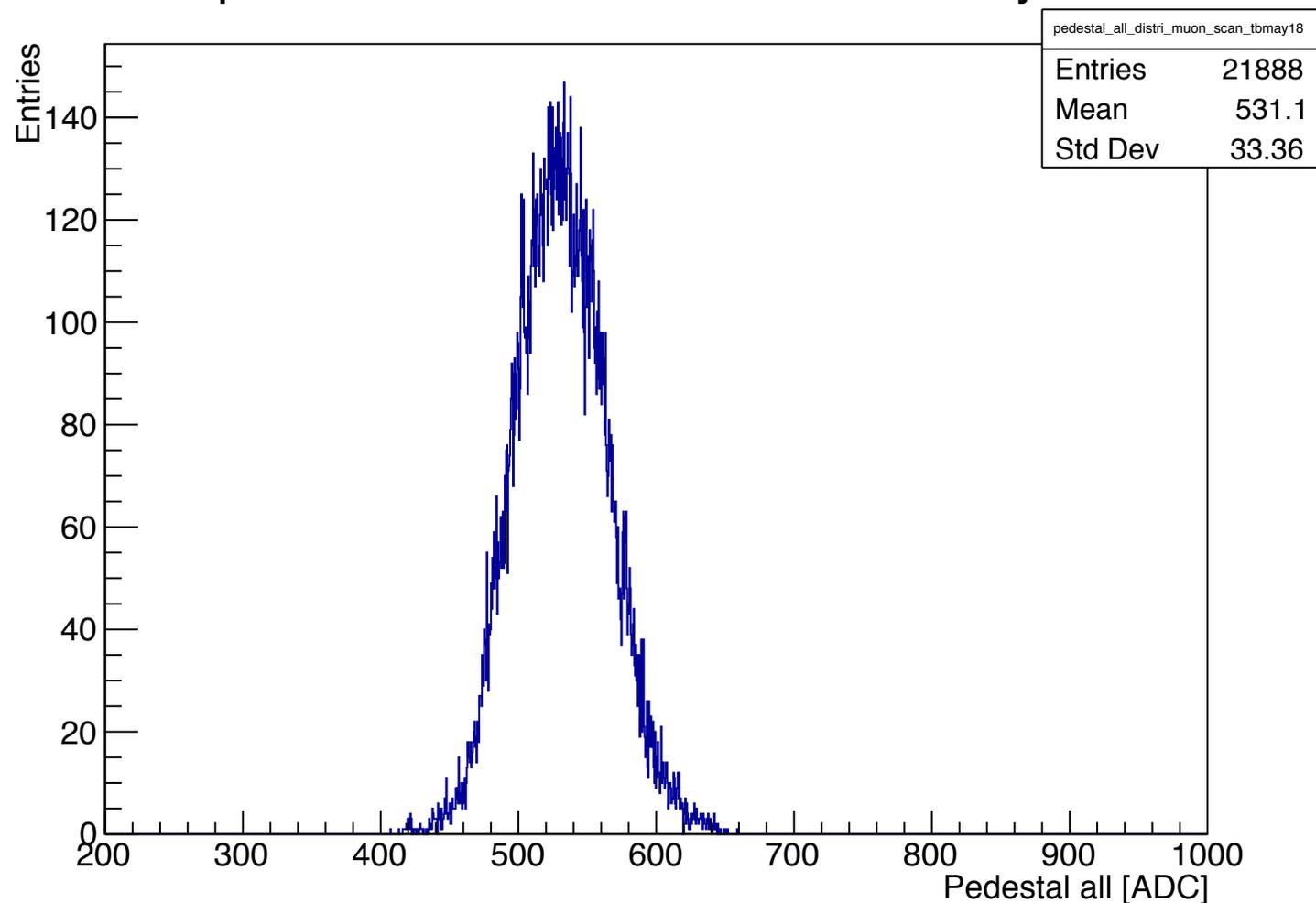
Outline ToDo list

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 - Chipwise, memcell 0 only, memcell 1 only, etc.
- For individual memcell 0,1,2 same channels, pedestal value difference:
 - Two runs (short time scale and long time scale) **2. (✓) Check May vs June**
 - Two runs (May vs. June and PP vs. no PP) **3. ✓**
- Implement MIP - Pedestal in MIP extraction
- Quality tests, Outliers etc. output pedestal (first) and MIP lists **4. (circled)**
- Compare μ runs PP vs no PP, higher statistics **5.**
- MIP/Pedestal T-check **6.**

Pedestal Quality Check

First pedestal quality check, full muon scan may 2018

pedestal_all_distri_muon_scan_tbmay18

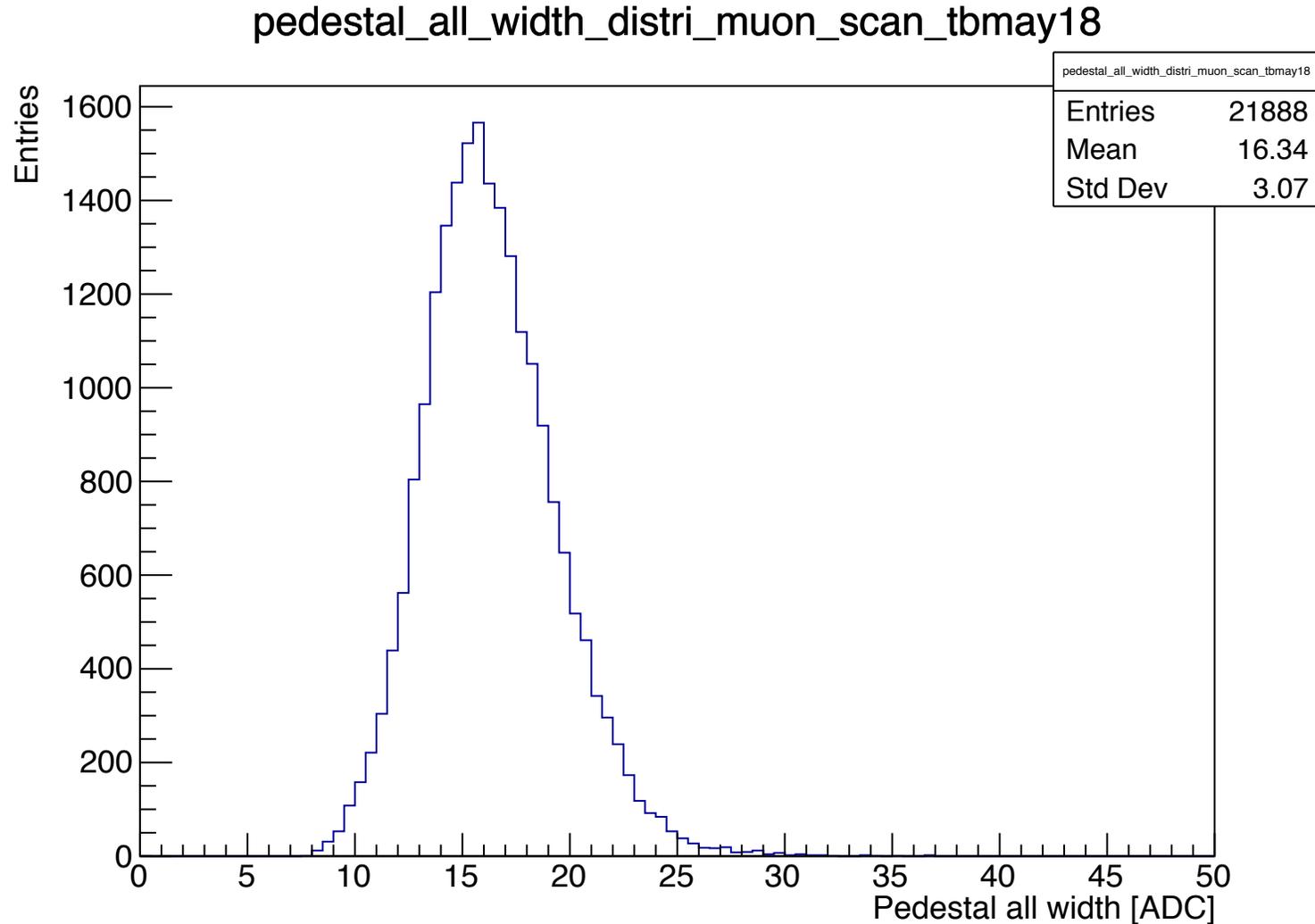


First quality check/outlier rejection for pedestal table (after that MIP):

- ➔ Plot all quantities (pedestal/width, memcell offsets), check for far outliers

Pedestal Quality Check

First pedestal quality check, full muon scan may 2018



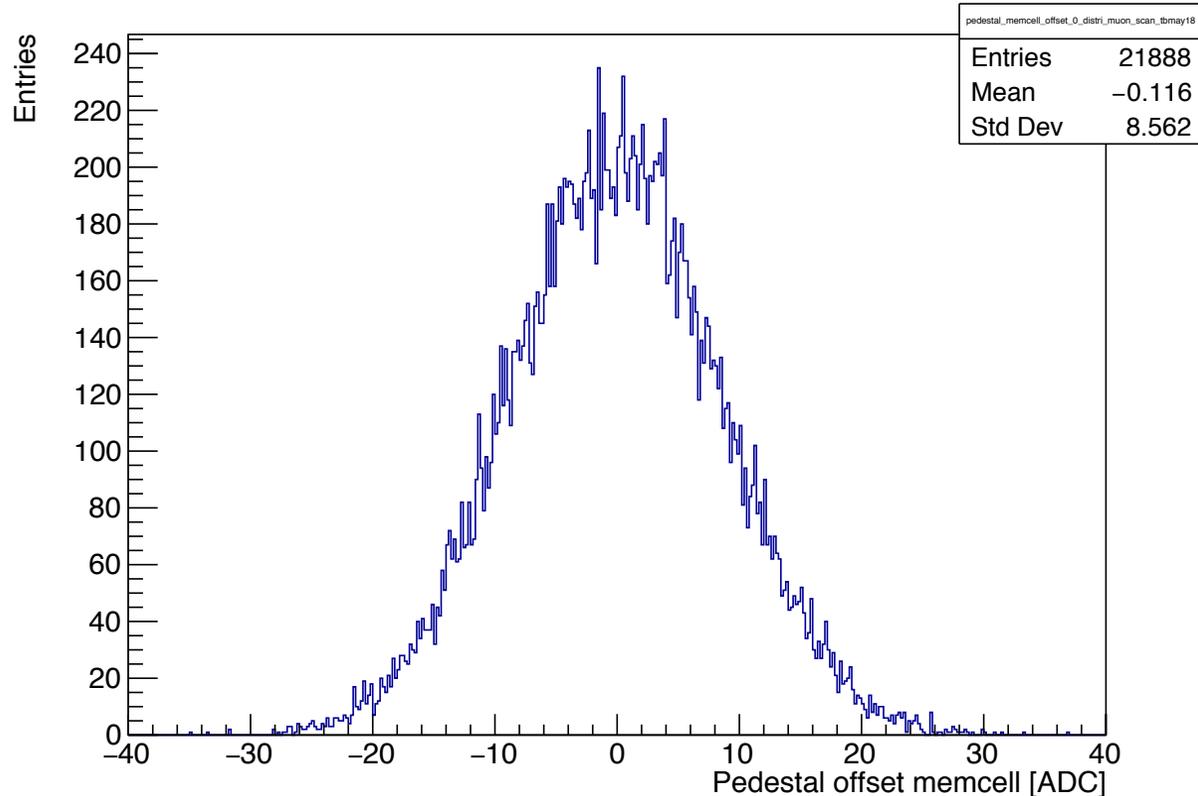
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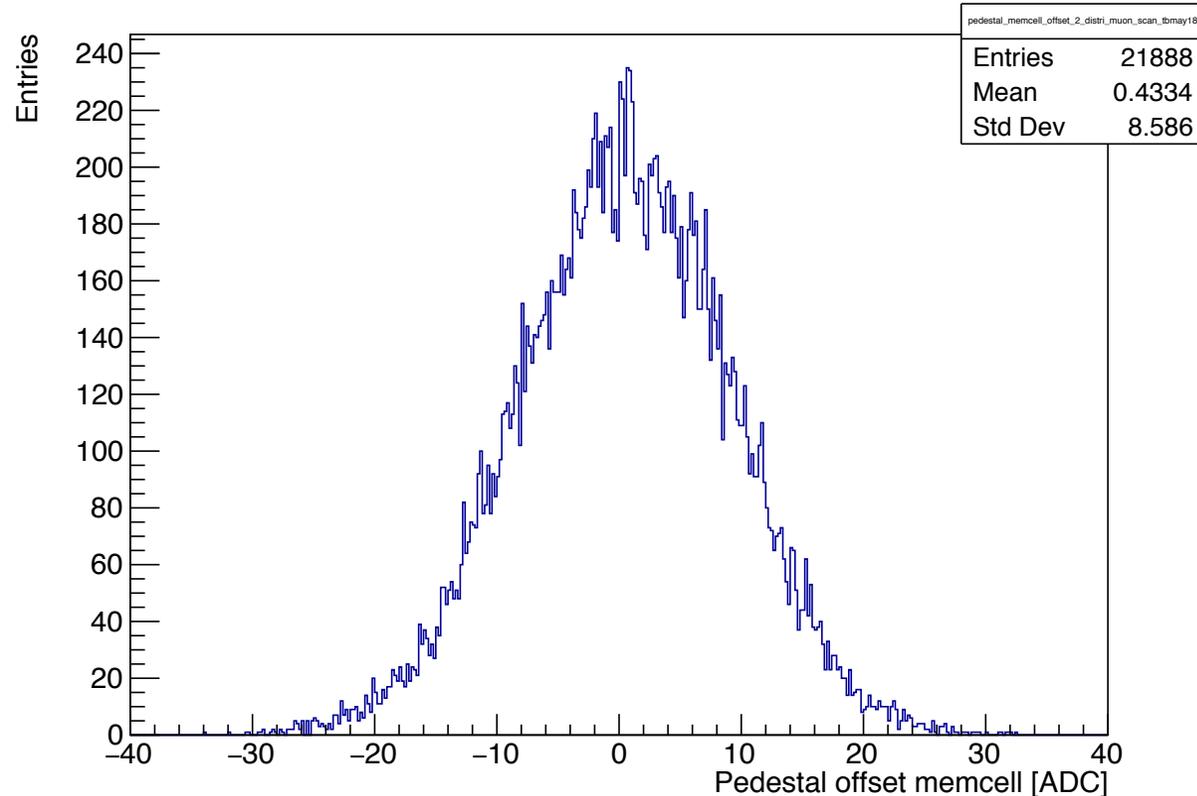
Pedestal Quality Check

First pedestal quality check, full muon scan may 2018

pedestal_memcell_offset_0_distri_muon_scan_tbmay18

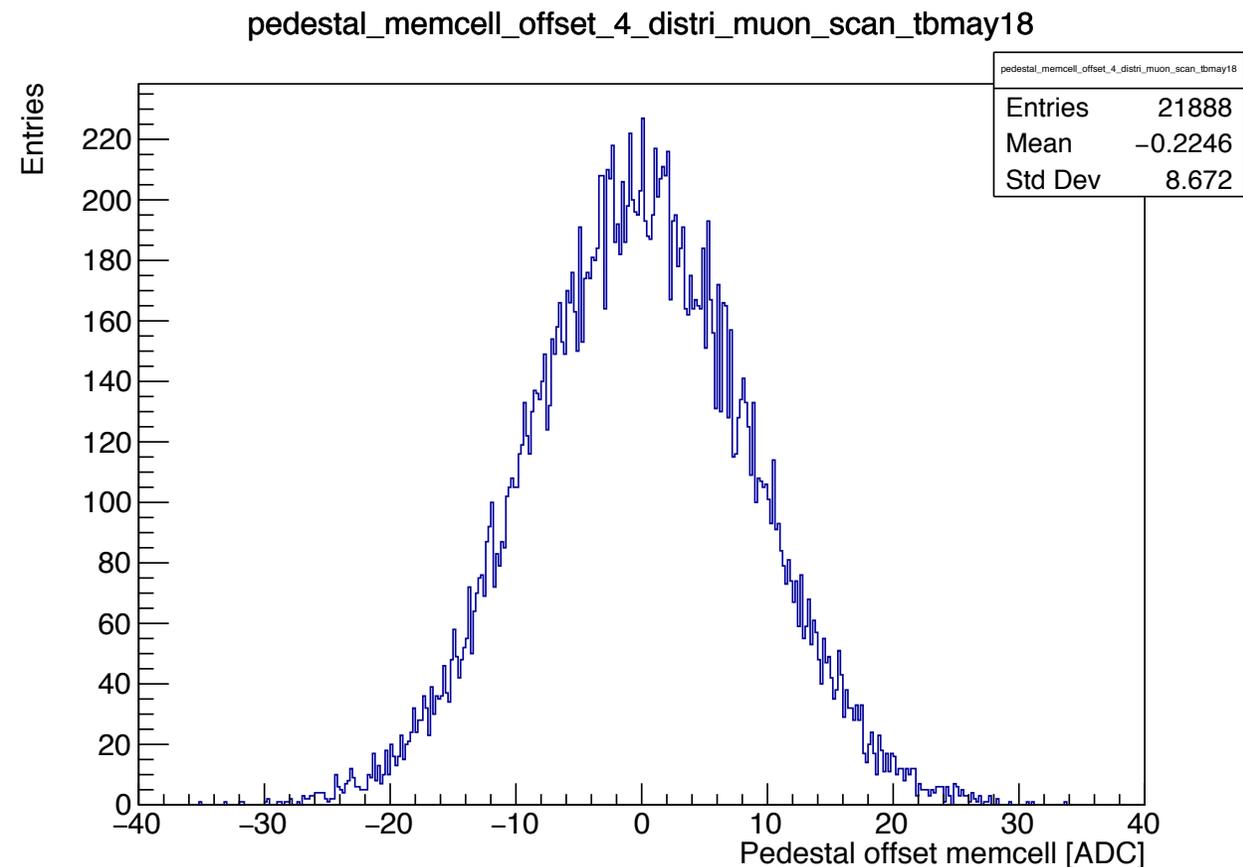
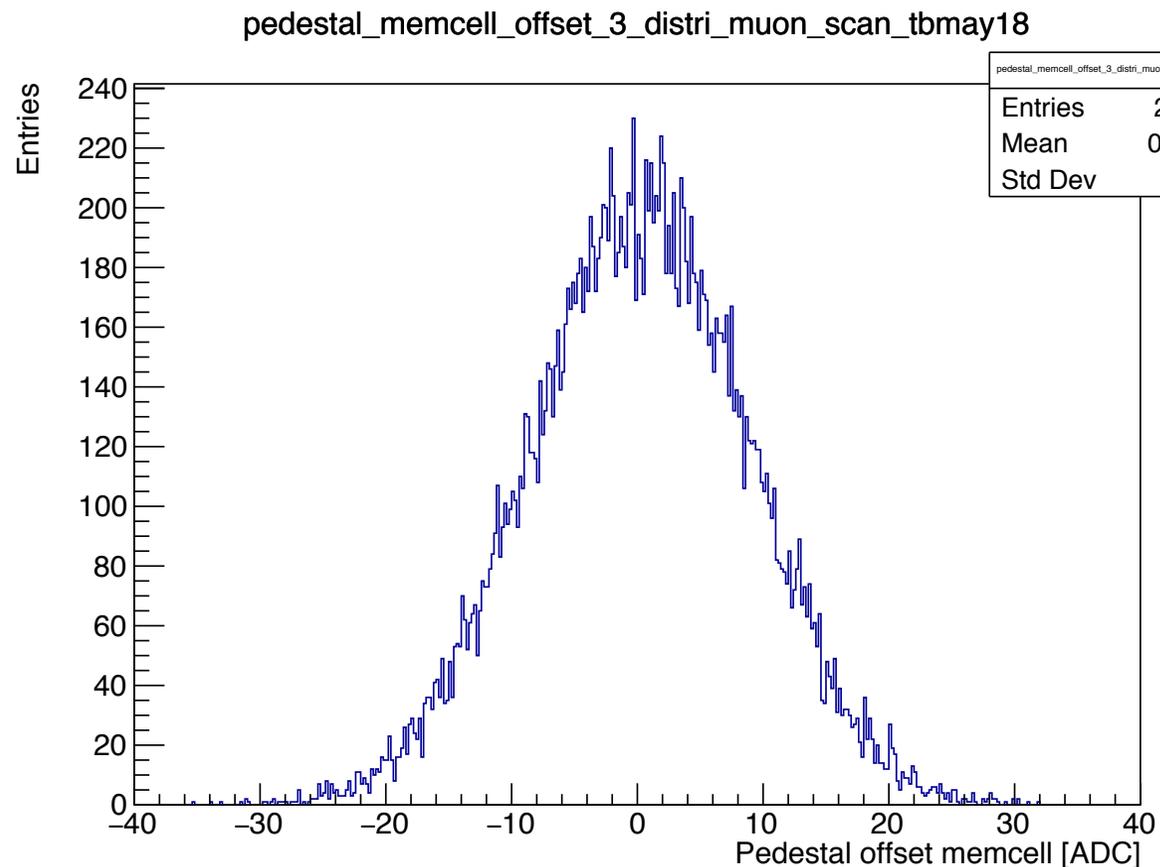


pedestal_memcell_offset_2_distri_muon_scan_tbmay18



Pedestal Quality Check

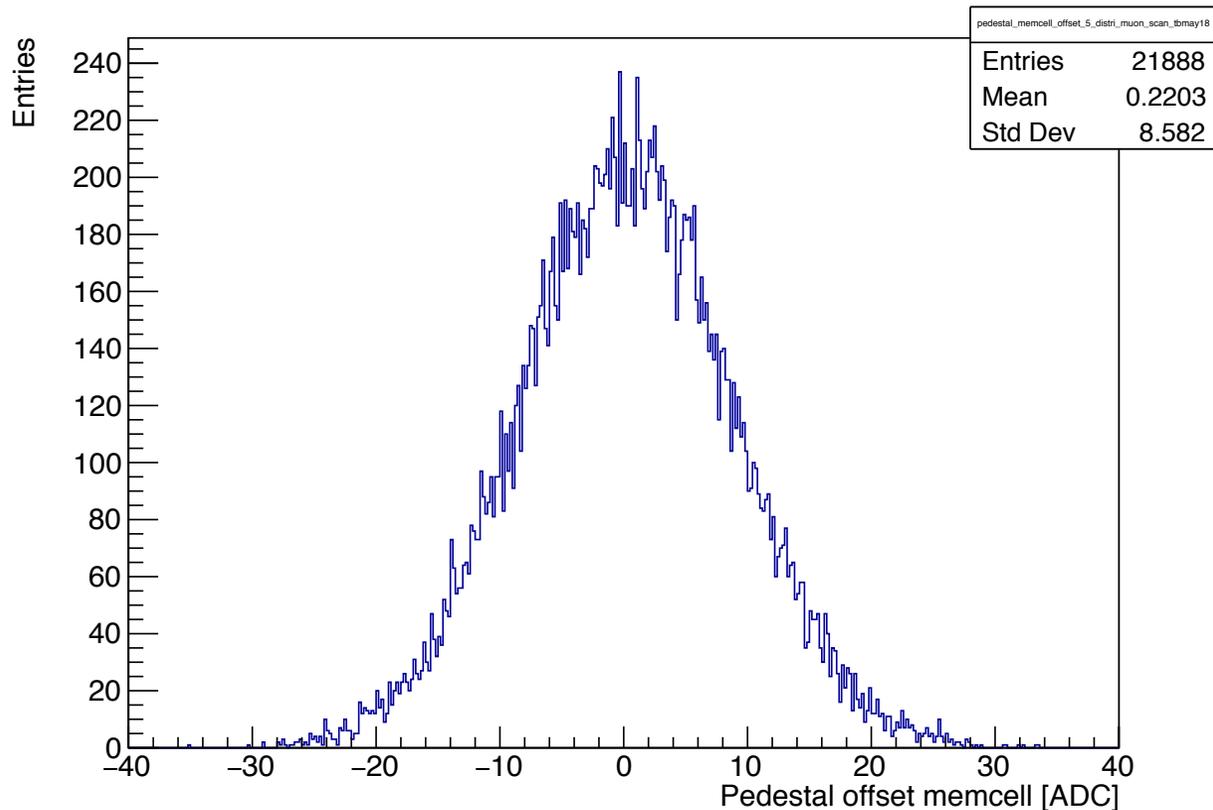
First pedestal quality check, full muon scan may 2018



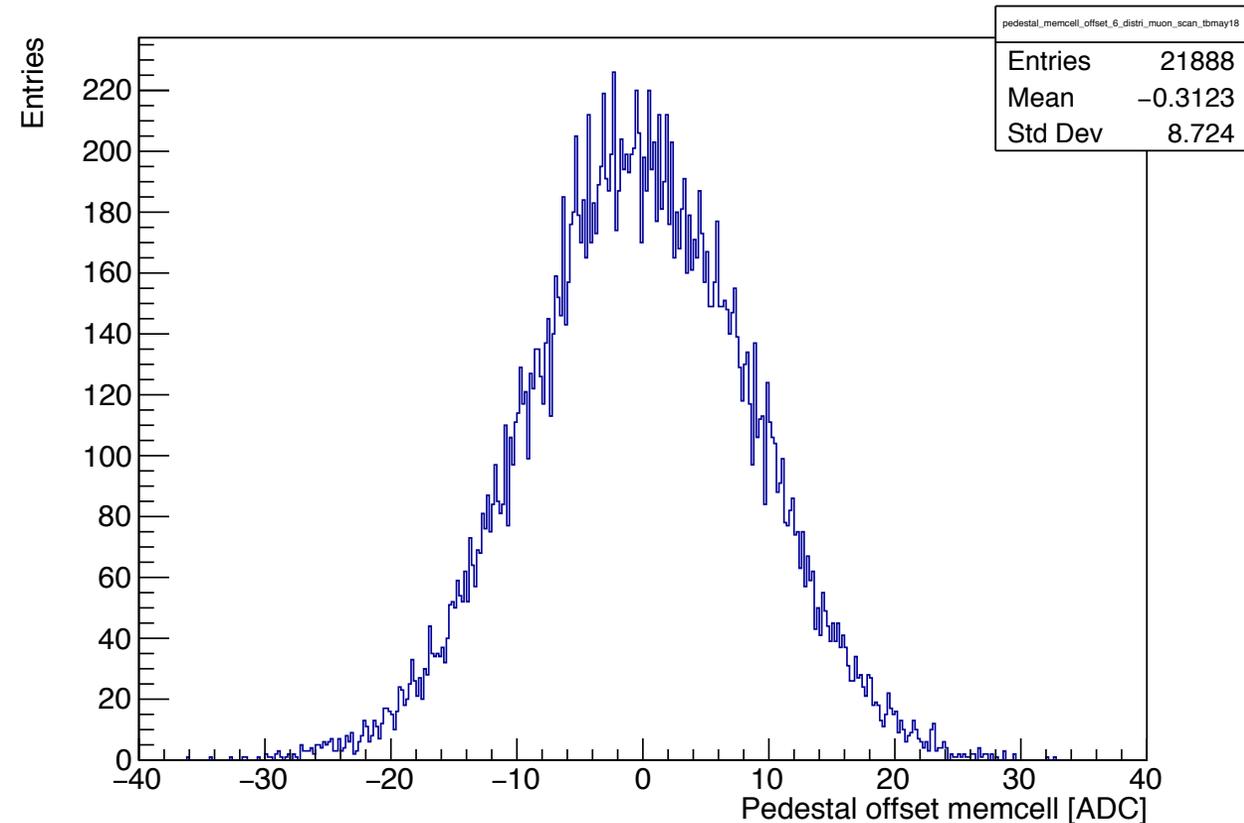
Pedestal Quality Check

First pedestal quality check, full muon scan may 2018

pedestal_memcell_offset_5_distri_muon_scan_tbmay18



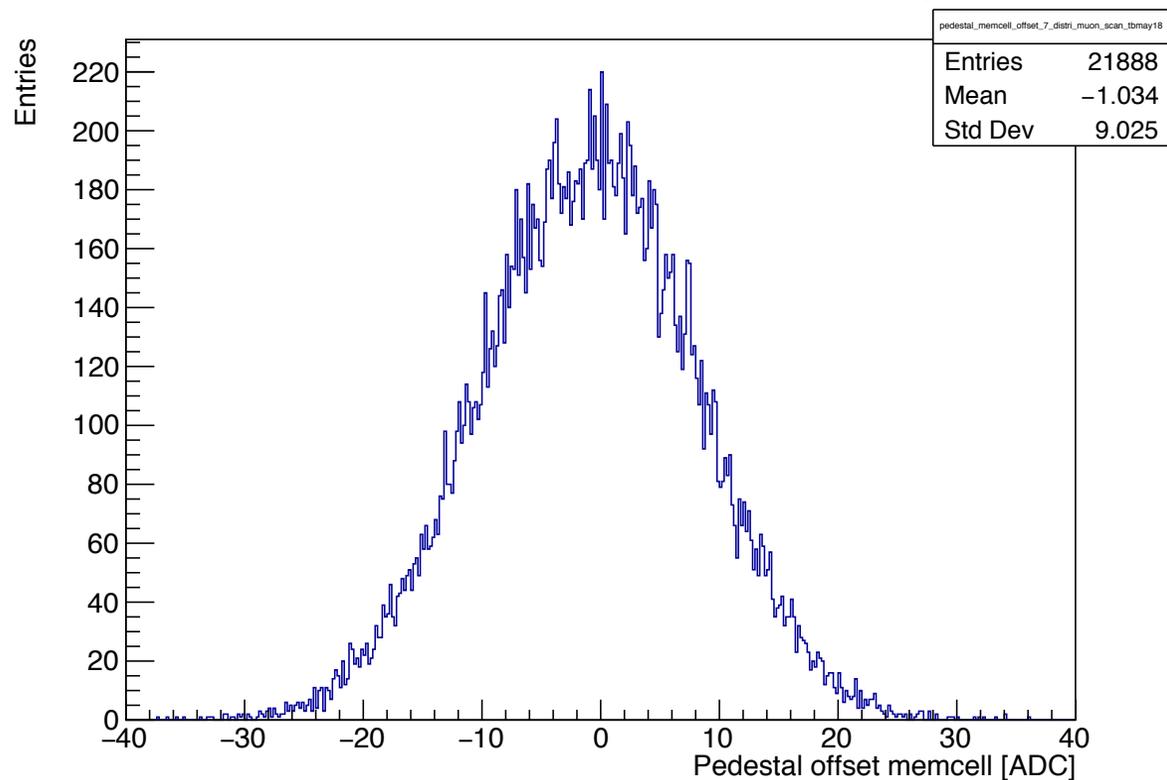
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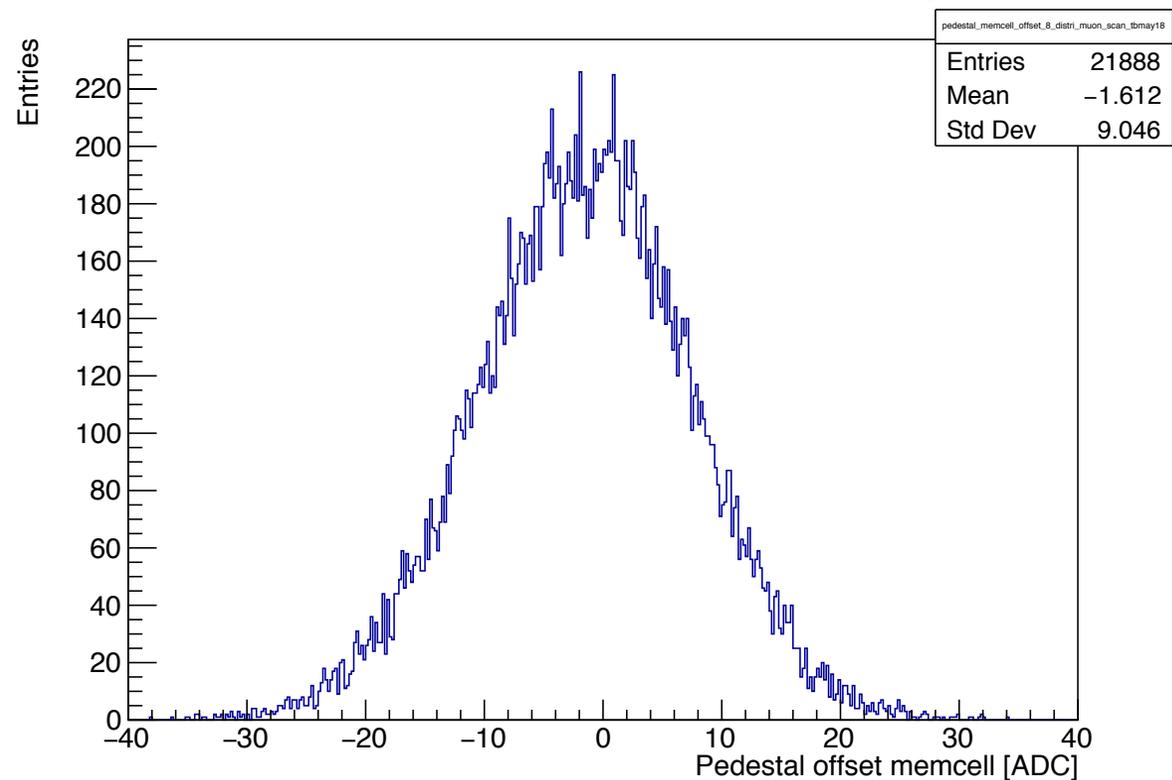
Pedestal Quality Check

First pedestal quality check, full muon scan may 2018

pedestal_memcell_offset_7_distri_muon_scan_tbmay18



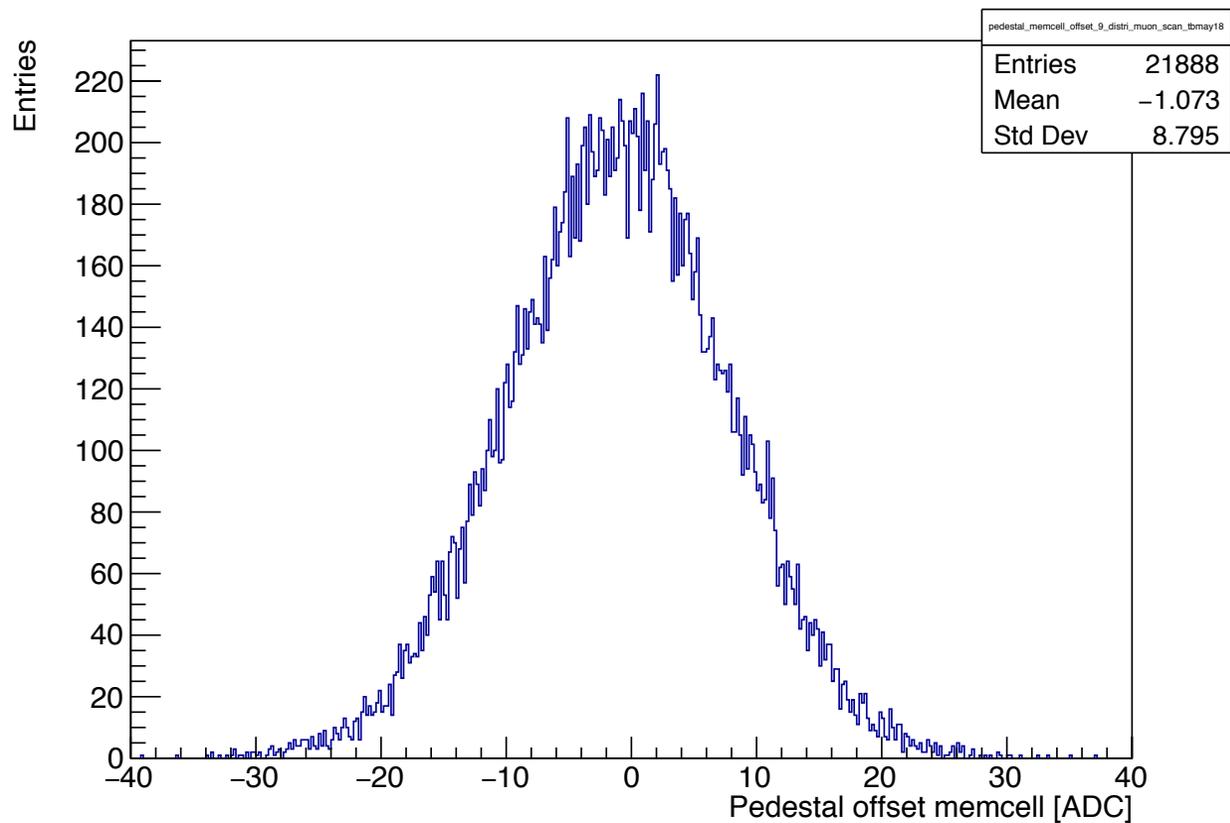
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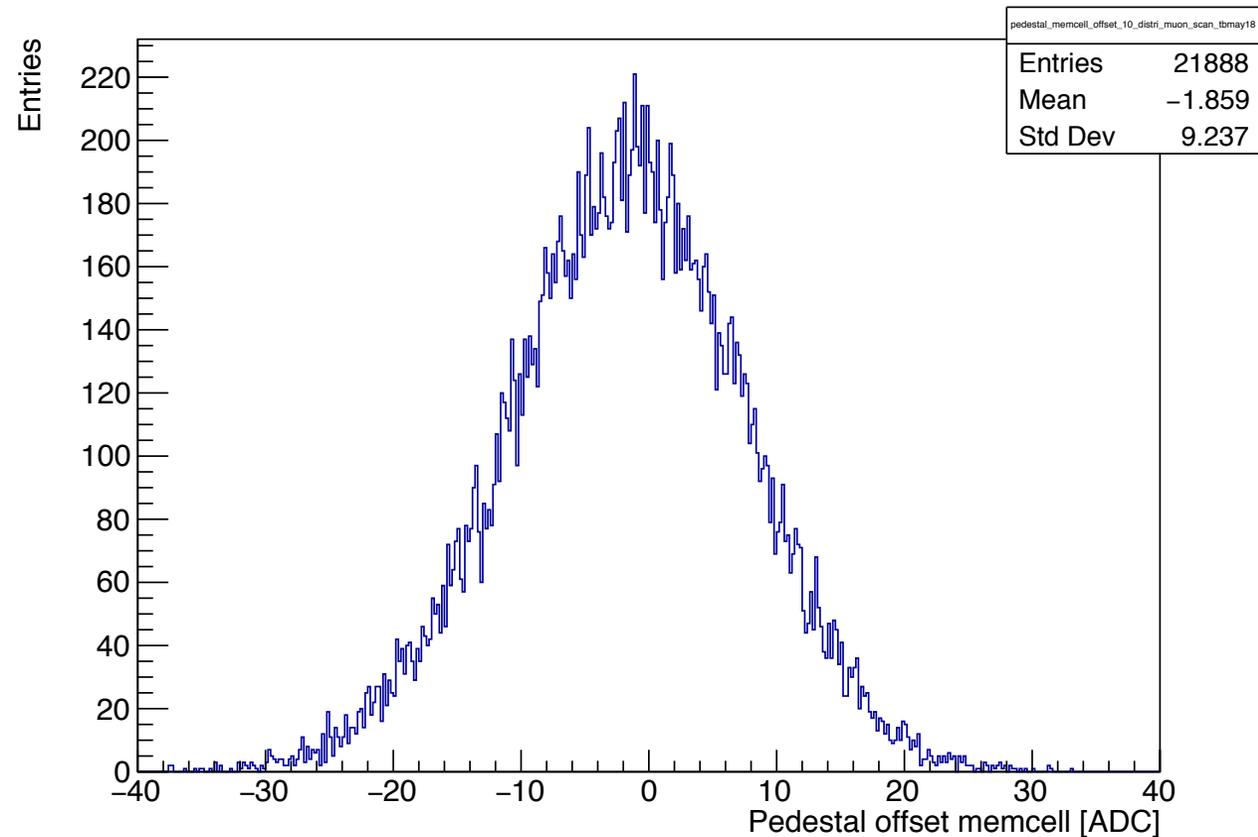
Pedestal Quality Check

First pedestal quality check, full muon scan may 2018

pedestal_memcell_offset_9_distri_muon_scan_tbmay18



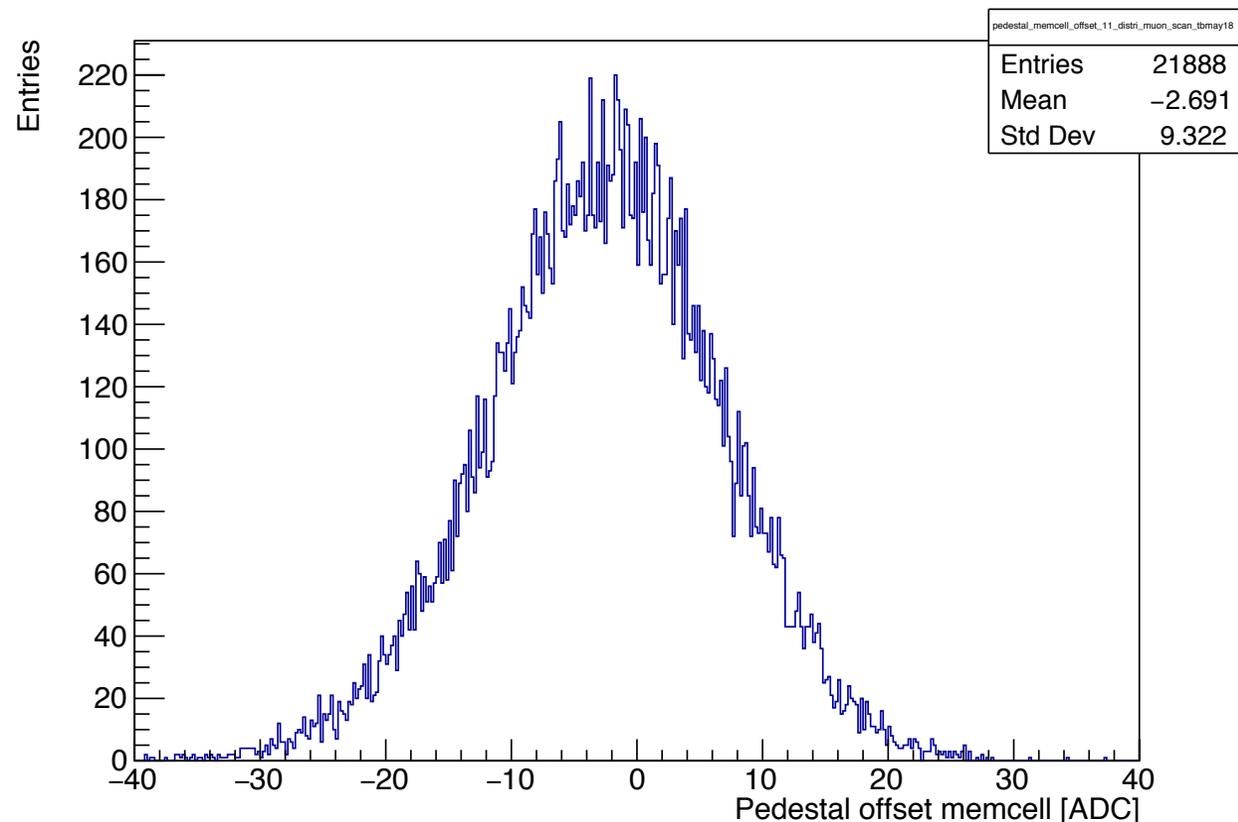
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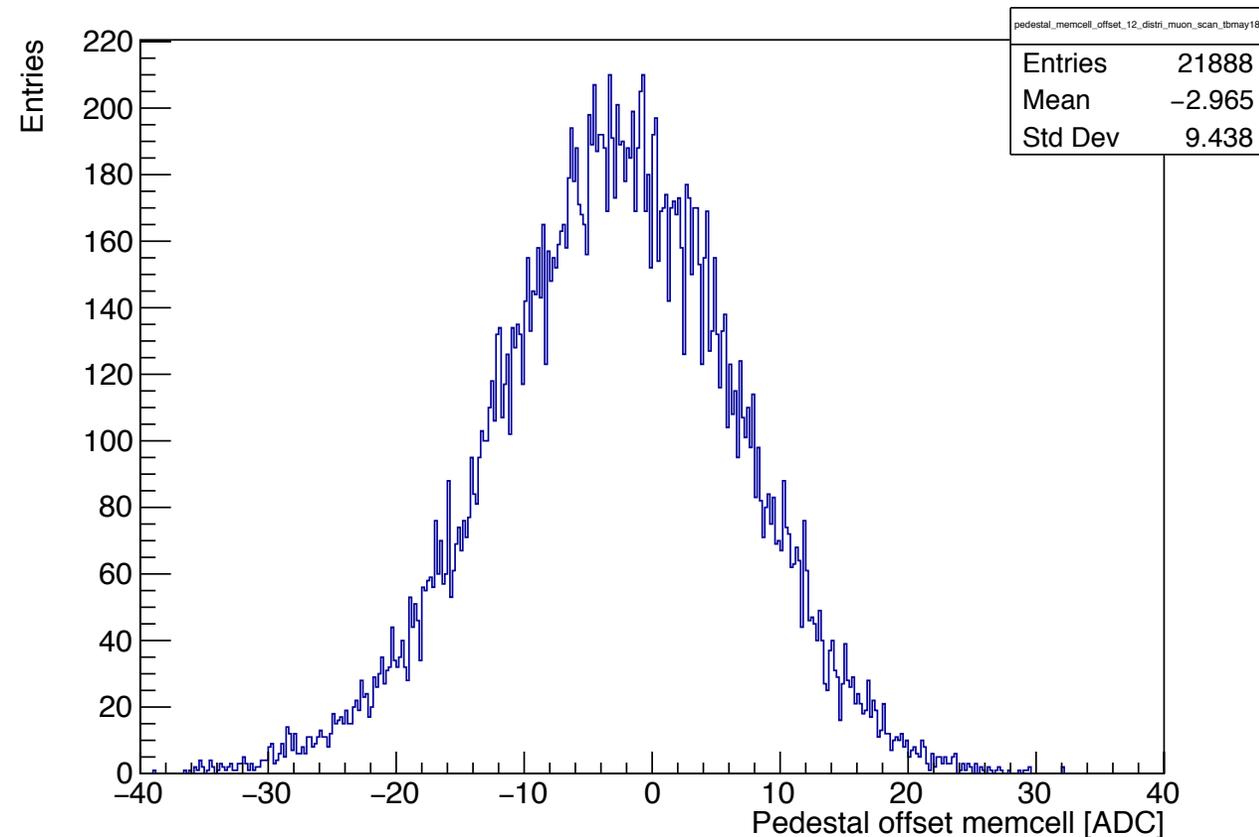
Pedestal Quality Check

First pedestal quality check, full muon scan may 2018

pedestal_memcell_offset_11_distri_muon_scan_tbmay18



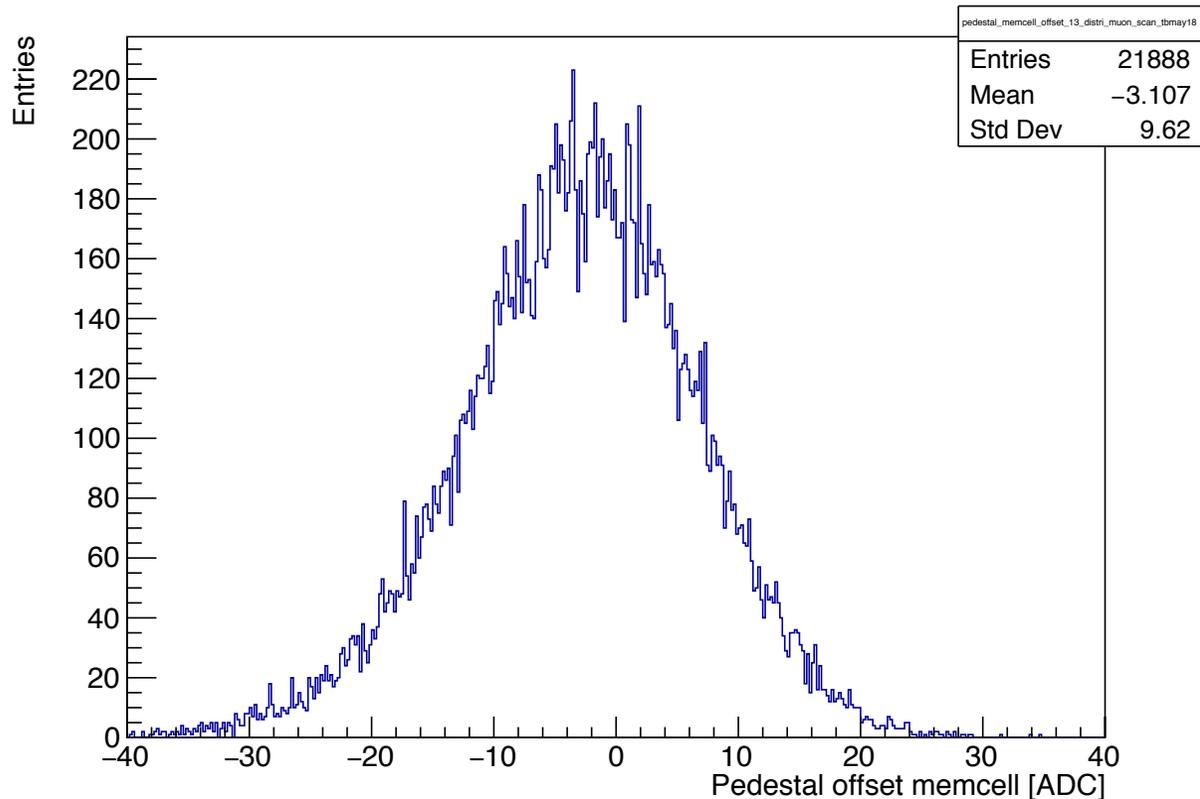
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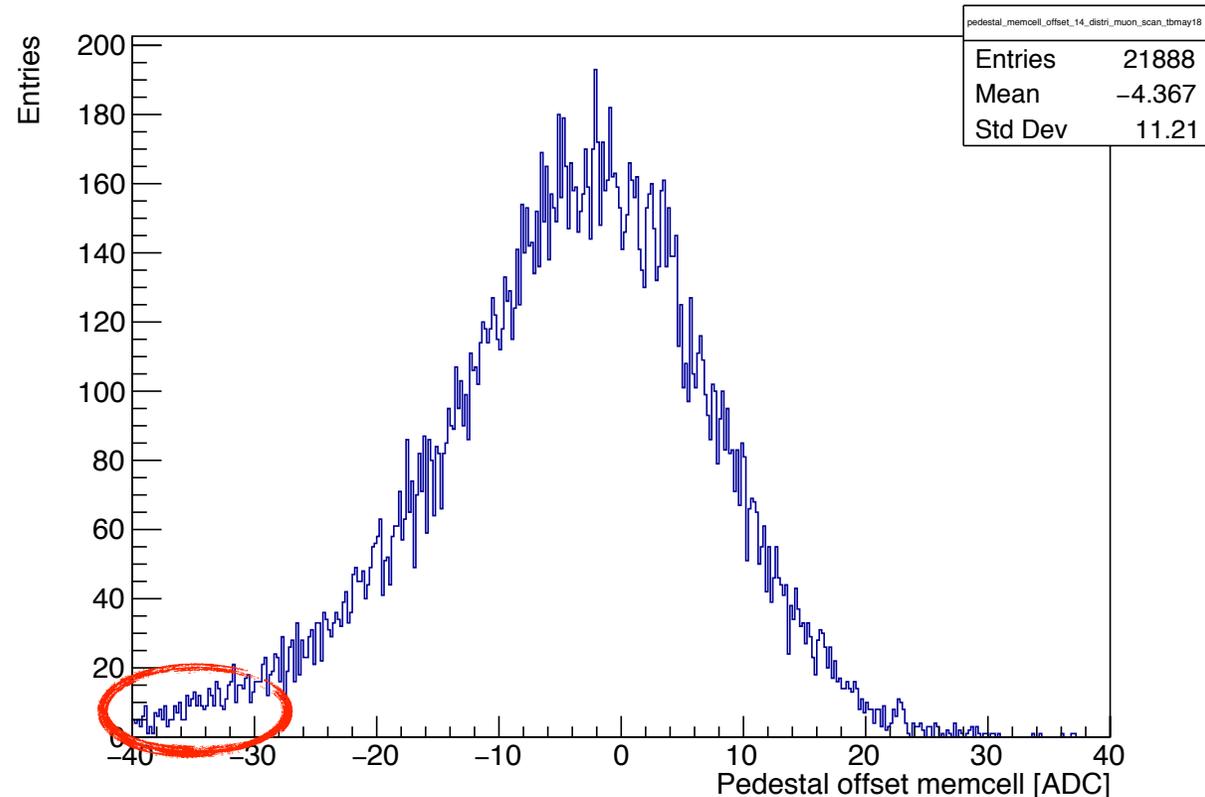
Pedestal Quality Check

First pedestal quality check, full muon scan may 2018

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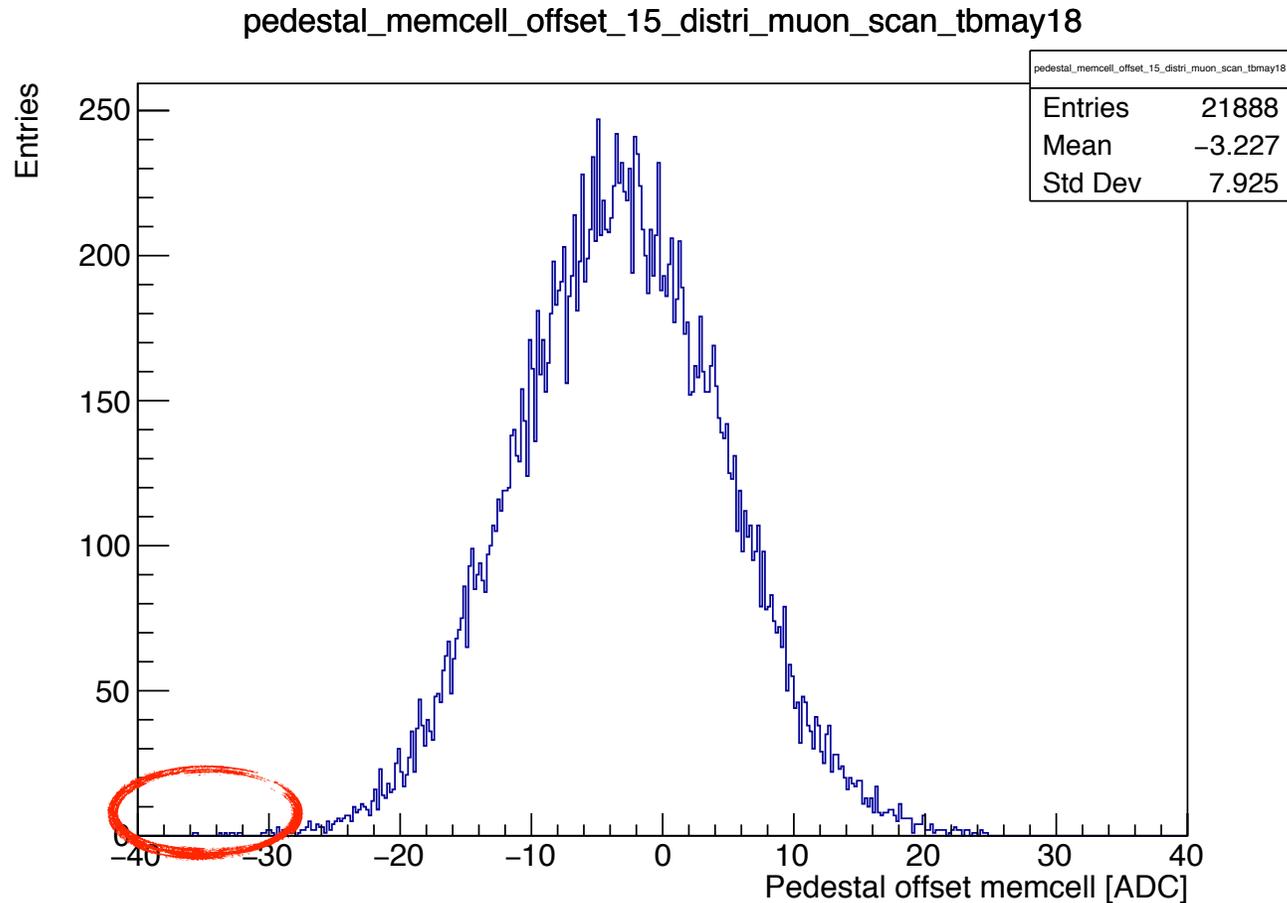


pedestal_memcell_offset_14_distri_muon_scan_tbmay18



Pedestal Quality Check

First pedestal quality check, full muon scan may 2018



➔ Check known dead/bad channels

➔ Set conditions, check outliers, look at individual pedestal spectra (ChipID, channel (all), memcell individual)

Dead and Bad Channels

[map_dead_bad_channels.pdf](#)

Module	Chip(0-15)	Channel(0-35)	comment
1	8	5	MIP O.K., bad LED
3	11	12	no signal, dead
6	2	3	noisy, dead
15	8	32	no signal, dead
24	1	19	noisy or too low LY
33	7	5	no signal, dead
34	1	9	LED O.K., bad MIP shape
37	4	20	LED O.K., bad MIP shape

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