

# Bpm pedestal study

-- to check beam position

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# BPM pedestal Study

□ Goal: To help resolve the yields drift problems

- Two issues about beam position
  - Previously Calibrated Beam position ~ current dependence
  - Beam position jumps in the same energy setting

□ Last time

- Showed how BPM pedestal change
- The pedestal effects on beam position calibration  
1000adc change in one channel ~ 0.2mm at BPM ~ 0.8mm (0.8mrad) at target

# BPM pedestal Study

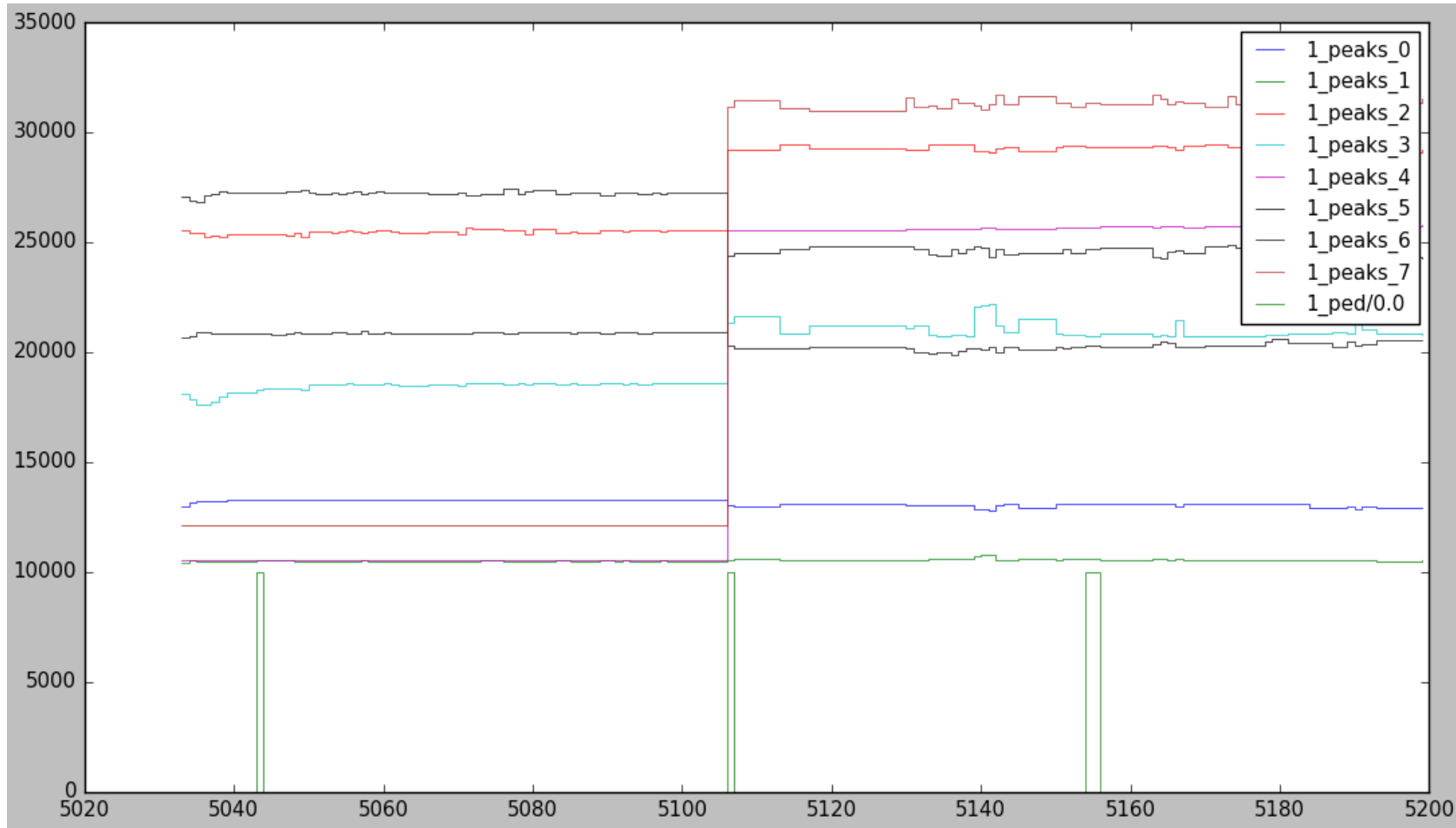
## □ Pedestal

- Few pedestal run + pedestal value were drifting?
- use beam trip events to get pedestal

This talk focus on:

- Beam trip events  real pedestal?

# BPM pedestal Study



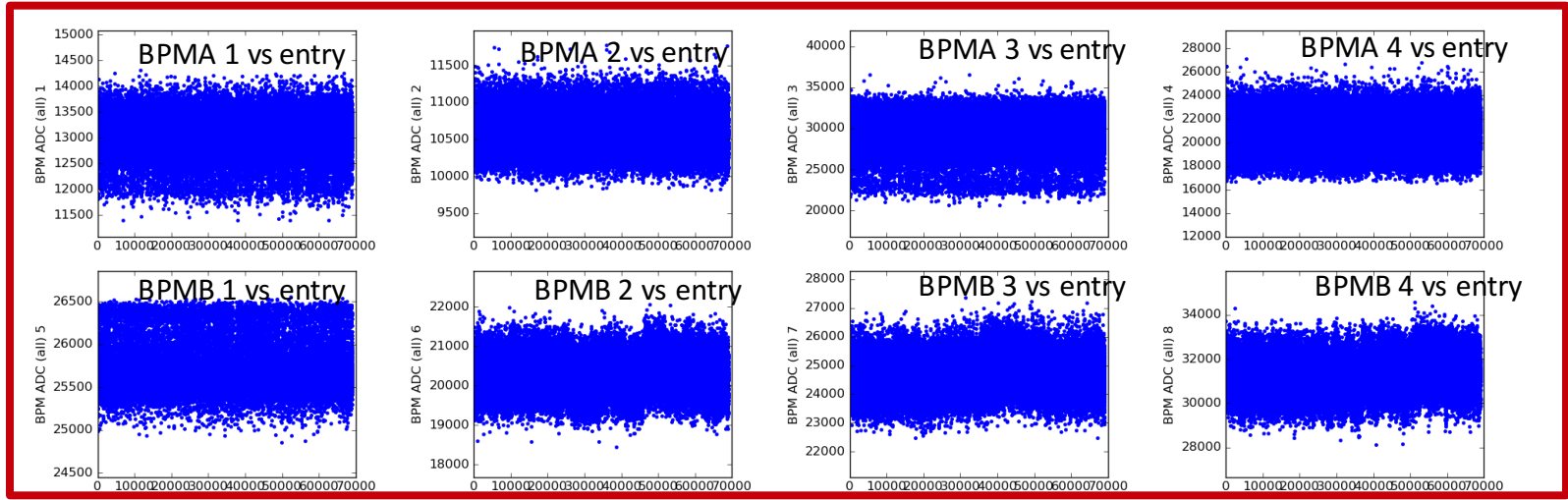
Beam Energy 1.1GeV

Run (No beam in whole run):  
5043  
5106  
5154

No dedicated pedestal run  
In this run range

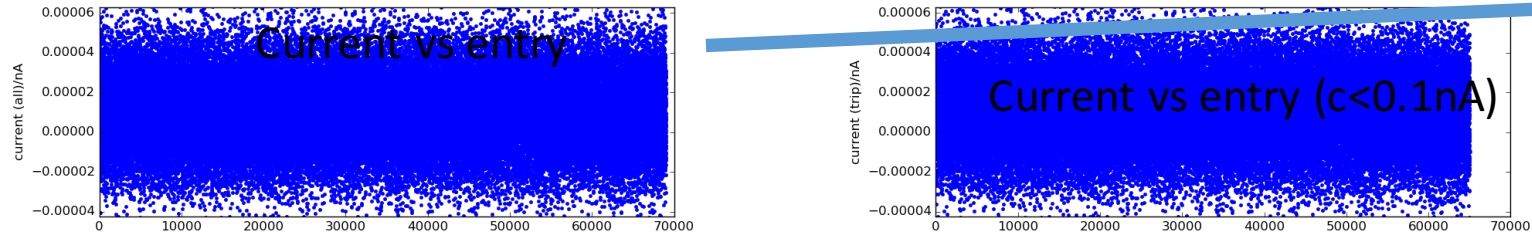
Around run 5103, BPM gain  
Changed

# Run 5154 - - No beam whole run



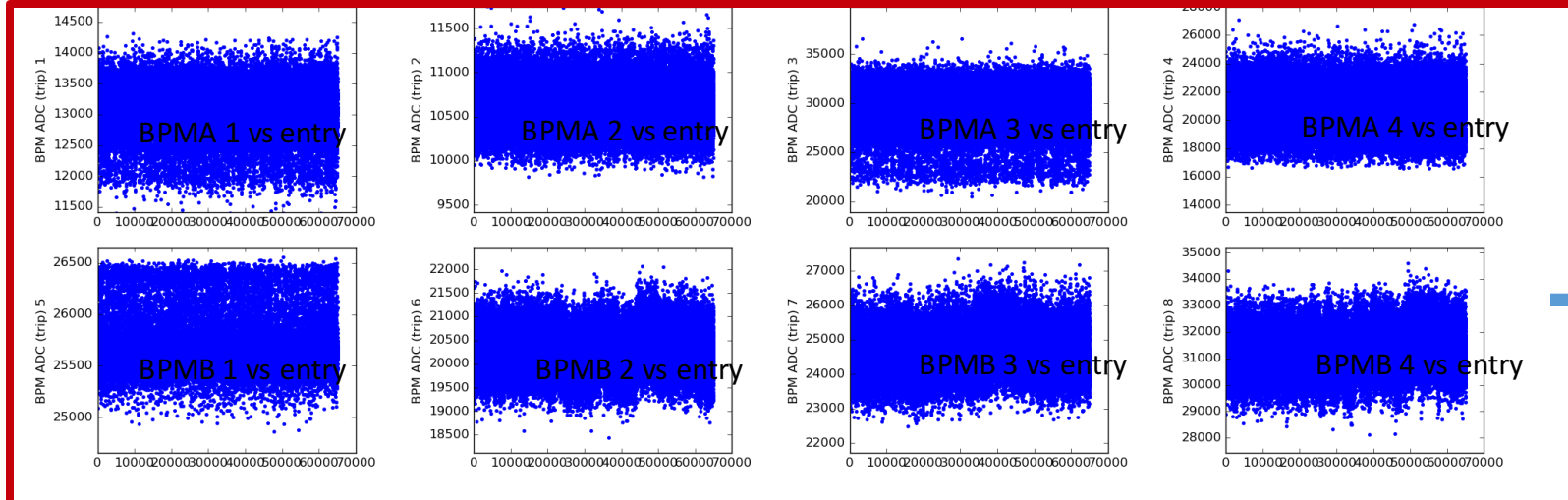
Total Entry: 70k  
Trip entry: 70k

BPM raw for whole run



Current for whole run(uA)

Current for tripped part (uA)



BPM raw for tripped part (after applying the cut in page 8)

# BPM pedestal Study

Run (No beam whole run) versus partly beam tripped run

Run Number	Status	channel 1	channel 2	channel 3	channel 4	channel 5	channel 6	channel 7	channel 8
5,151	FALSE	13,091	10,587	29,416	20,792	25,686	20,162	24,667	31,337
5,152	FALSE	13,082	10,590	29,376	20,769	25,676	20,254	24,527	31,184
5,154	TRUE	13,078	10,578	29,356	20,744	25,652	20,291	24,695	31,313
5,156	FALSE	13,099	10,561	29,351	20,852	25,704	20,251	24,728	31,257
5,163	FALSE	13,113	10,578	29,377	20,727	25,693	20,379	24,350	31,729
5,164	FALSE	13,086	10,578	29,381	20,763	25,728	20,483	24,273	31,531
5,165	FALSE	13,095	10,572	29,328	20,735	25,704	20,434	24,597	31,289
5,166	FALSE	13,009	10,608	29,194	21,466	25,712	20,240	24,654	31,381

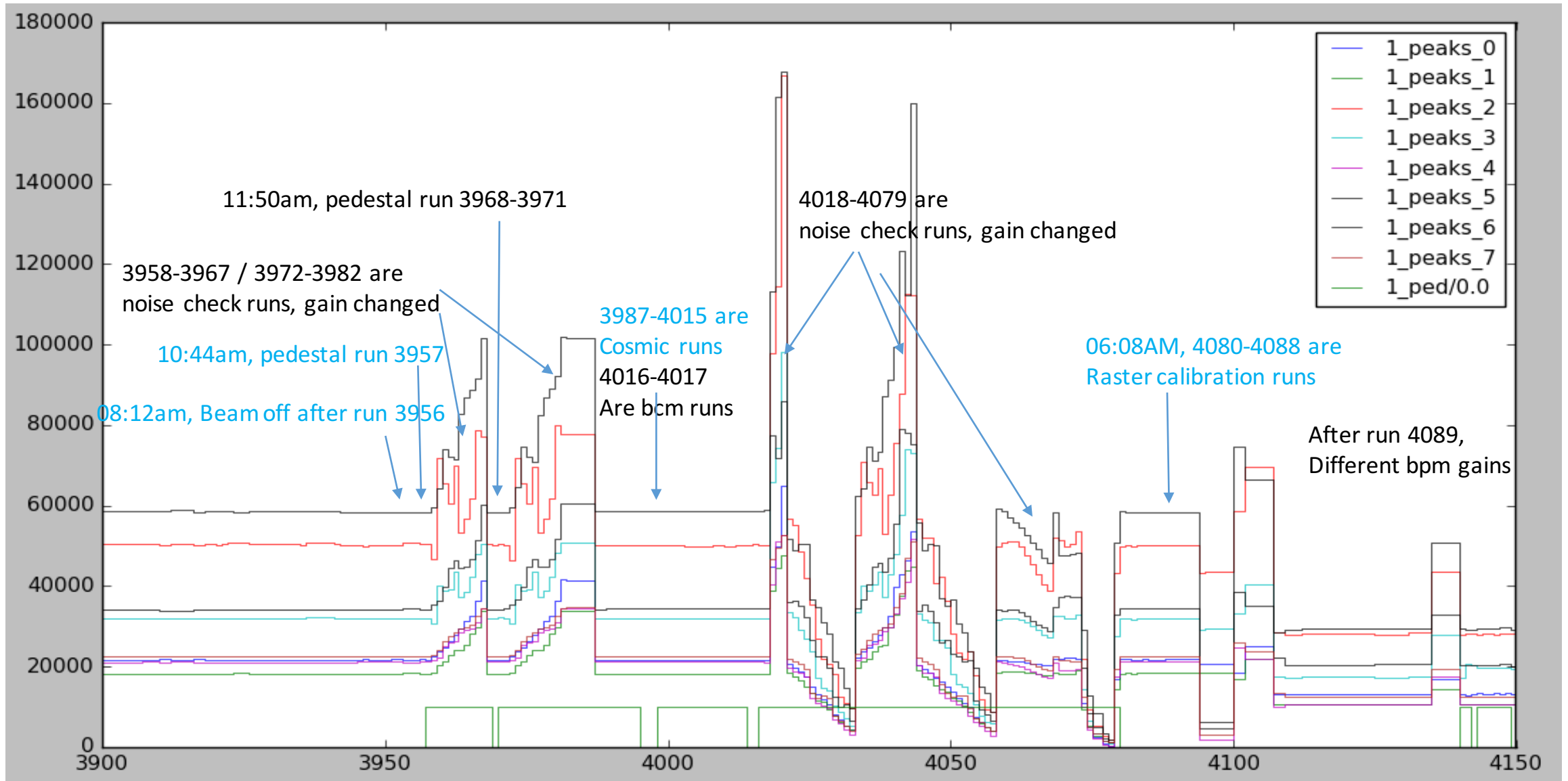
Rms value for each channel for run 5154, difference within uncertainty

Conclusion: Beam trip cut is reliable

270.1	219.0	2357.3	1200.4	144.8	1900.4	898.1	267.9
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# BPM pedestal Study

Beam Energy 1.7GeV



# BPM pedestal Study

Run Number	Status	channel 1	channel 2	channel 3	channel 4	channel 5	channel 6	channel 7	channel 8
3,953	FALSE	21,771	18,351	50,680	32,062	21,151	58,222	34,374	22,619
3,956	FALSE	21,780	18,267	50,466	31,953	21,159	58,439	34,235	22,639
3,957	TRUE	21,725	18,320	50,374	31,994	21,184	58,426	34,195	22,631
3,968	TRUE	21,727	18,280	50,402	32,034	21,167	58,439	34,184	22,626
3,969	TRUE	21,706	18,253	50,155	31,950	21,176	58,356	34,235	22,622
3,970	TRUE	21,687	18,306	50,515	32,143	21,174	58,419	34,265	22,621
3,971	TRUE	21,736	18,328	50,258	31,990	21,176	58,245	34,395	22,615
3,987	TRUE	21,742	18,293	50,262	32,013	21,170	58,587	34,314	22,644
3,989	TRUE	21,744	18,286	50,138	31,981	21,162	58,567	34,360	22,633
3,991	TRUE	21,744	18,274	50,049	31,943	21,176	58,614	34,349	22,641
3,995	TRUE	21,742	18,282	50,207	31,984	21,167	58,558	34,381	22,637
3,998	TRUE	21,750	18,262	50,066	31,960	21,183	58,669	34,333	22,639
3,999	TRUE	21,758	18,260	50,037	31,921	21,179	58,656	34,385	22,644
4,001	TRUE	21,741	18,262	50,175	31,971	21,160	58,555	34,415	22,635
4,003	TRUE	21,773	18,240	49,998	31,905	21,165	58,543	34,382	22,637
4,008	TRUE	21,749	18,260	50,156	31,959	21,170	58,720	34,328	22,653
4,010	TRUE	21,748	18,275	49,998	31,898	21,161	58,613	34,407	22,637
4,012	TRUE	21,747	18,301	50,199	31,974	21,168	58,559	34,424	22,631
4,014	TRUE	21,760	18,270	50,204	31,986	21,159	58,733	34,395	22,648
4,015	TRUE	21,761	18,274	50,333	32,018	21,158	58,771	34,399	22,651
4,080	FALSE	21,796	18,321	49,922	31,913	21,178	58,637	34,335	22,644
4,081	FALSE	21,785	18,373	50,219	31,976	21,165	58,353	34,398	22,622
4,082	FALSE	21,720	18,269	49,877	31,786	21,164	58,339	34,386	22,625

Removed the runs  
With gain changed

Rms for channel 1-4

443	724	4393	1829
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Rms for channel 5-8

228	2461	1903	383
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# BPM pedestal Study

## □ Pedestal

- Beam trip value from production runs (before run 3957)

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Pedestal run (run 3957 ... ) with same bpm gain settings

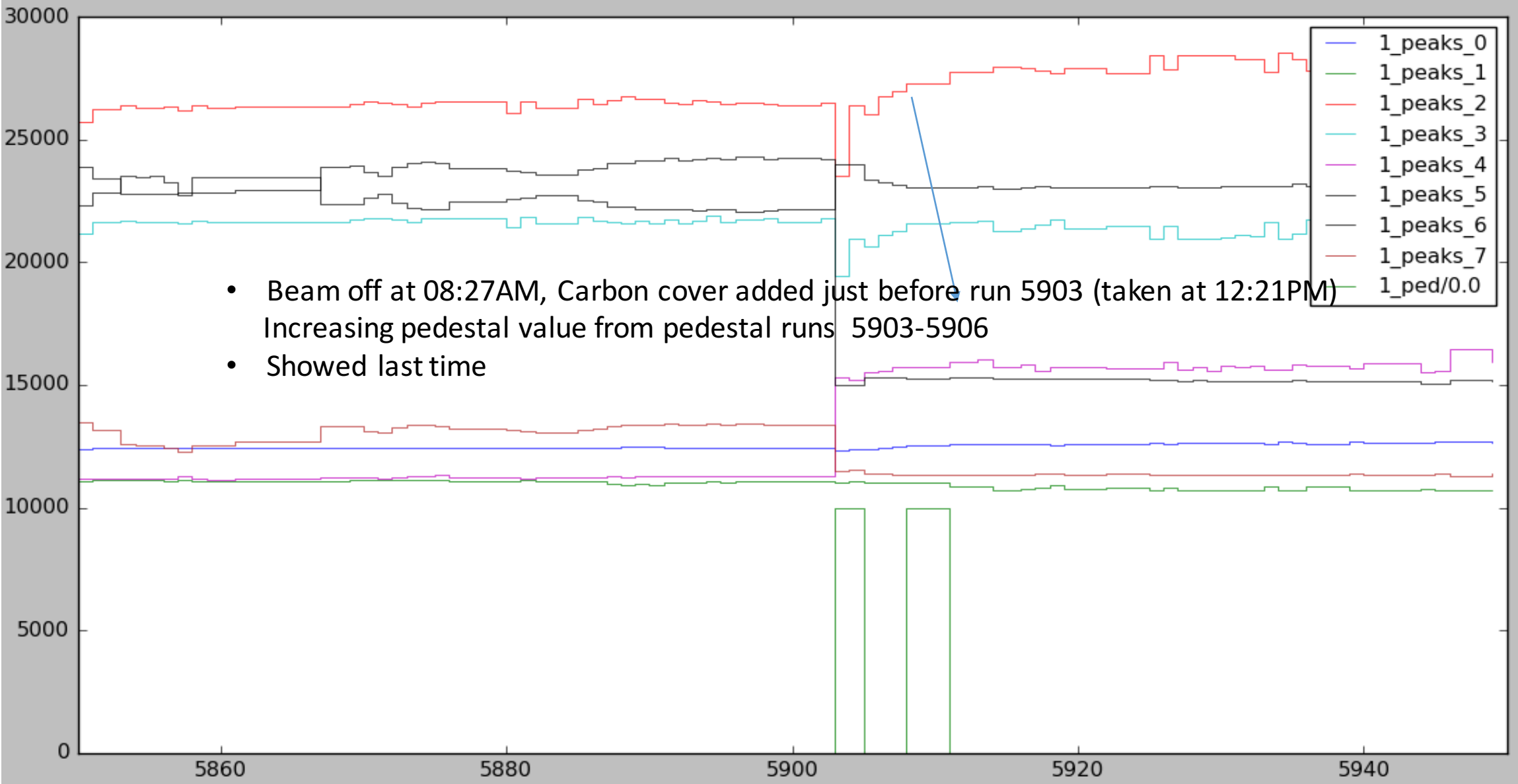
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Beam trip value from raster calibration runs/production runs

These relation holds for almost all production runs (if same bpm condition)

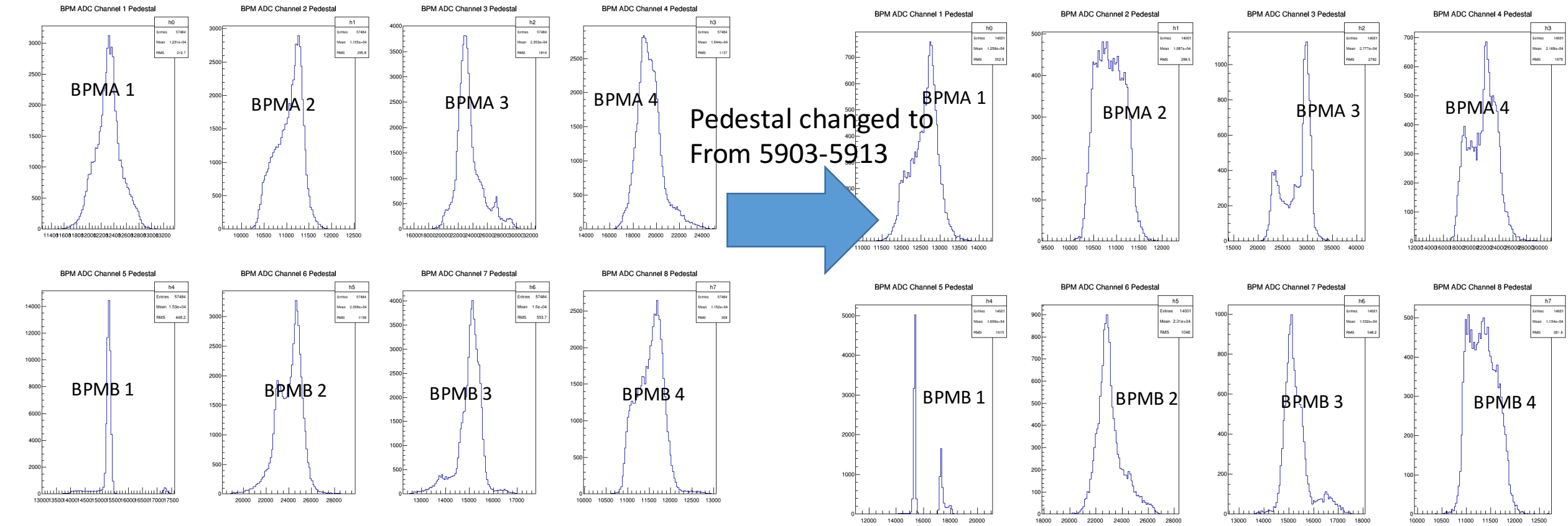
Checked setting: 1.1/1.7GeV, 2.2 GeV Long/tran...

# BPM pedestal Study



# Run 5903

# Run 5913 - - after D



- From run 5903 to 5912, the double peak strength changes in channel3, the right peak become bigger and bigger, so the pedestal value keep increasing till 5913

# Pedestal Study

- Will start to look at BPM calibration procedure