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**
  - Beam trip events real pedestal

This talk focus on:

- More study on pedestal drift, double-peaks or jumps
BPM pedestal Study

D:
• Add second carbon cover

D-E:
• Run 5903-5904 pedestal run
• 5903-5904 taken within 4 mins
• Target ramp up/down/up during Run 5905-5906
• Run 5909-5910 bpm calibrations
• After run 5910, target quench ~ 10 hours
• Run 5911-5920 bpm calibrations
• Pedestal became stable from Run 5911
Pedestals for BPMB channel 1

The pedestals have more and more probability to be the higher value from run 5903-5913.

The pedestals stay in low or high value by random.
Pedestals for BPMB channel 1

Two Peak Ratio:
Run 5903 - 10:1
Run 5907 - 5:1
Run 5913 - 3:1

The pedestal have more probability To be the higher value From run 5903-5913
Pedestals for BPMA channel 3

Two Peak Ratio:
Run 5903 - 1:0.1
Run 5907 - 1:1.5
Run 5913 - 1:3

The pedestal have more probability
To be the higher value
From run 5903-5913
Issue: whether to stay in $1^{\text{st}}$ peak or $2^{\text{nd}}$ peak by random

If exists a way to separate/correct the two peak (can relate back to beam run) to minimize the beam position uncertainty
Pedestals for BPMB channel 1

For this channel
-- no specific frequency component for each band
-- The total signal have specific frequency 30Hz, 60Hz, 180Hz...
  may be frequency for the bunch of events to choose band

FFT transform
Only the lower band
Did not see any peak

FFT transform
Only the Upper band
Did not see any peak
Pedestals Jumps between G and J

G:
- After run 6143, septum trip and Moller
- After Moller, flood in Hall A
- Beam back run 6144
- 20 hours between run 6143-6144

H:
- After run 6173, target anneal BCM calibration
- 2.5 hours later, back production

I:
- After run 6179, escorted access to check septum trip (not real trip, but rebooted)
- 2 hours later, back production

J:
- Jumps happen run 6210
- But continuous taking data from run 6208-6212, no stop
Pedestals for BPMA channel 3 (red)

The pedestal jump between G and J:

Just simply switch the two peak strength after recovering from beam down

Run 6119
Before G

Run 6151
Between G and H

Run 6177
Between H and I
-- Jump back

Run 6190
Between I and J
-- Jump gain
Pedestal Study

☐ Any suggestions?

☐ Will start to look at BPM calibration procedure