Performance of Tevatron Flying Wire Detectors and Emittance Measurements for Stores 3050-3532

05/28/04

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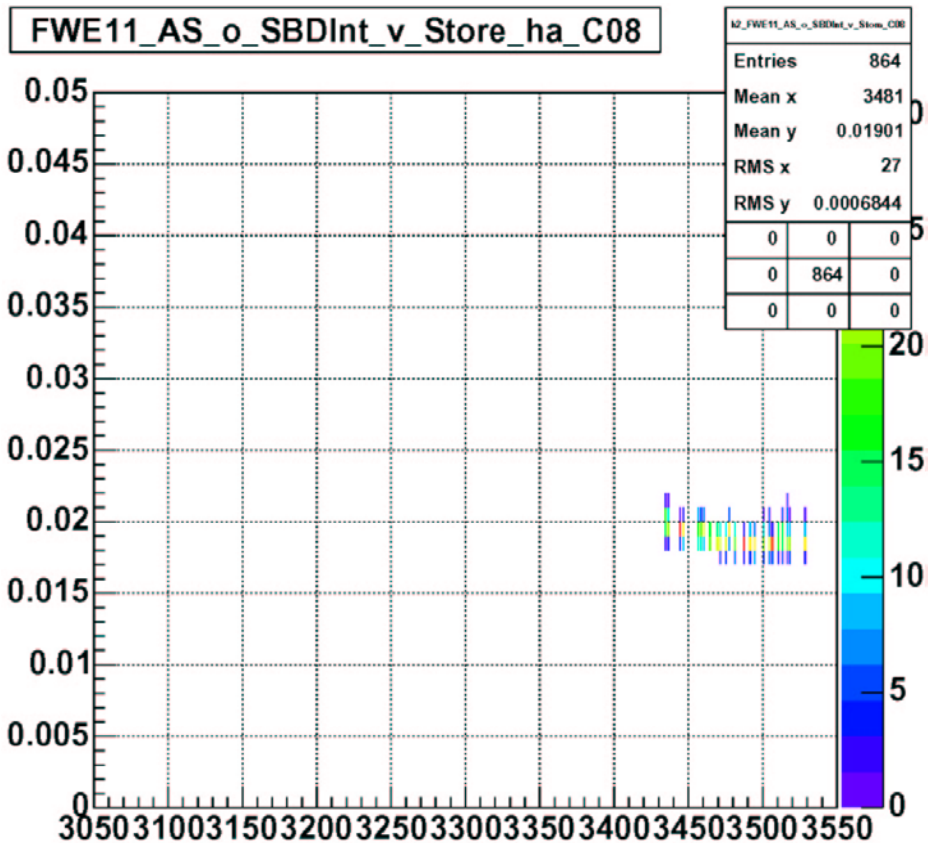
FNAL/CD

Performance of FW Detectors

- Stores 3050-3532 were analyzed excluding stores 3148-3325 when there was no E11 horizontal wire;
- The E11 proton detector has been showing signs of amplitude increase since March shutdown; other detectors have been stable;
- Despite the amplitude increase the detector does not show signs of saturation.
- The following plots are made using nominal lattice parameters and MDC dp/p formula as outlined in the note 888 & 656

Performance of FW E11 horizontal pbar detector

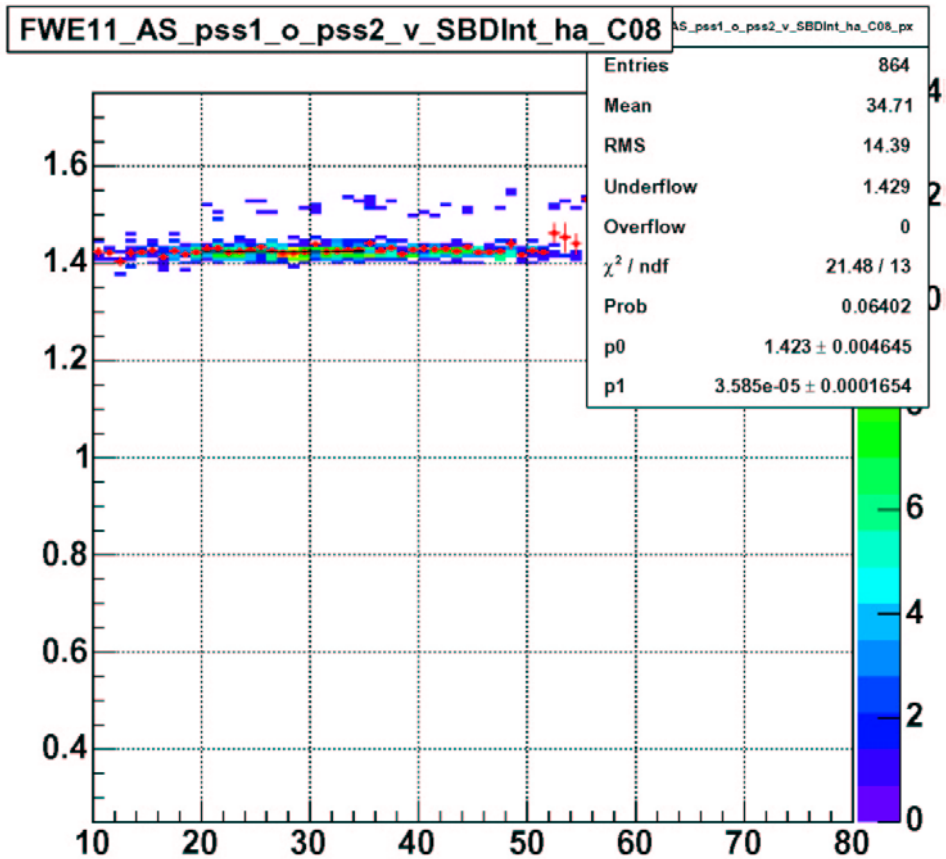
- The ratio of Bunch Amplitude times Sigma divided by SBDintensity versus Store for horizontal pbar detector is quite constant over time



Bunch Amplitude*Sigma divided by SBDintensity versus Store for horizontal pbar detector at 150 GeV.

Performance of FW E11 horizontal pbar detector

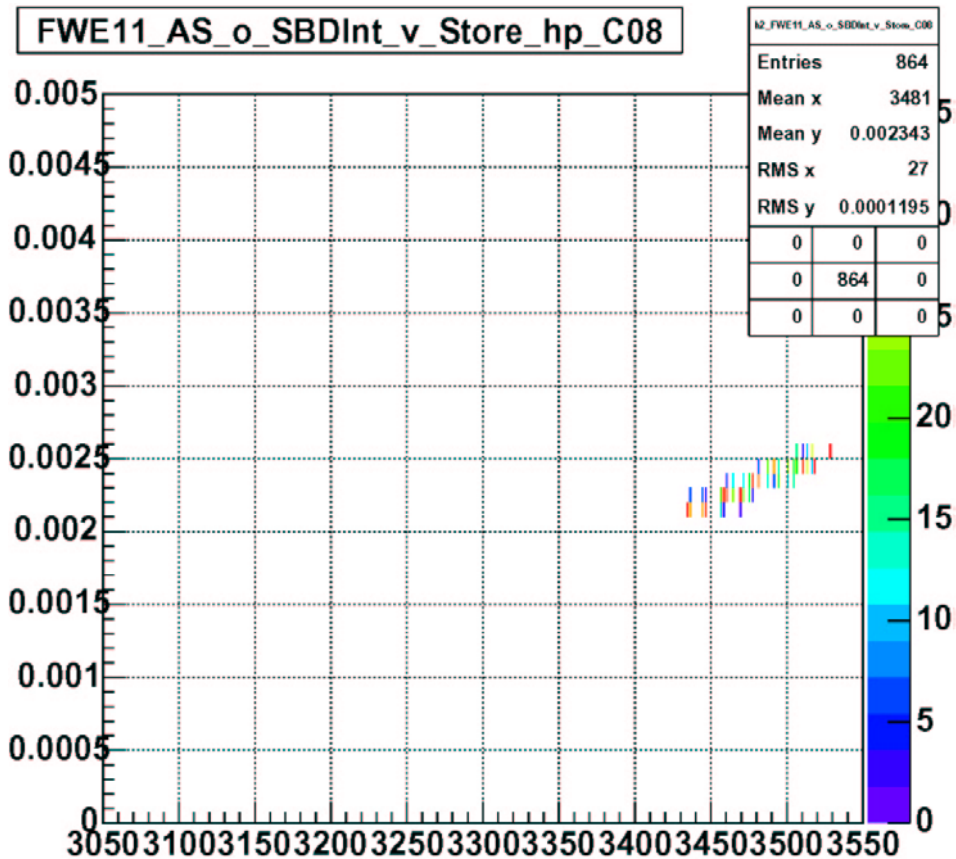
- Ratio of pass 1 over pass 2 of Bunch Amplitude times Sigma versus SBDintensity for horizontal pbar detector is quite constant and does not indicate that the detector is saturating



Ratio of pass 1 over pass 2 of Bunch Amplitude*Sigma versus SBDintensity for horizontal pbar detector at 150 GeV.

Performance of FW E11 horizontal proton detector

- The ratio of Bunch Amplitude times Sigma divided by SBDintensity versus Store for horizontal proton detector has been changing over time



Bunch Amplitude*Sigma divided by SBDintensity versus Store for horizontal proton detector at 150 GeV.

Performance of FW E11 horizontal proton detector

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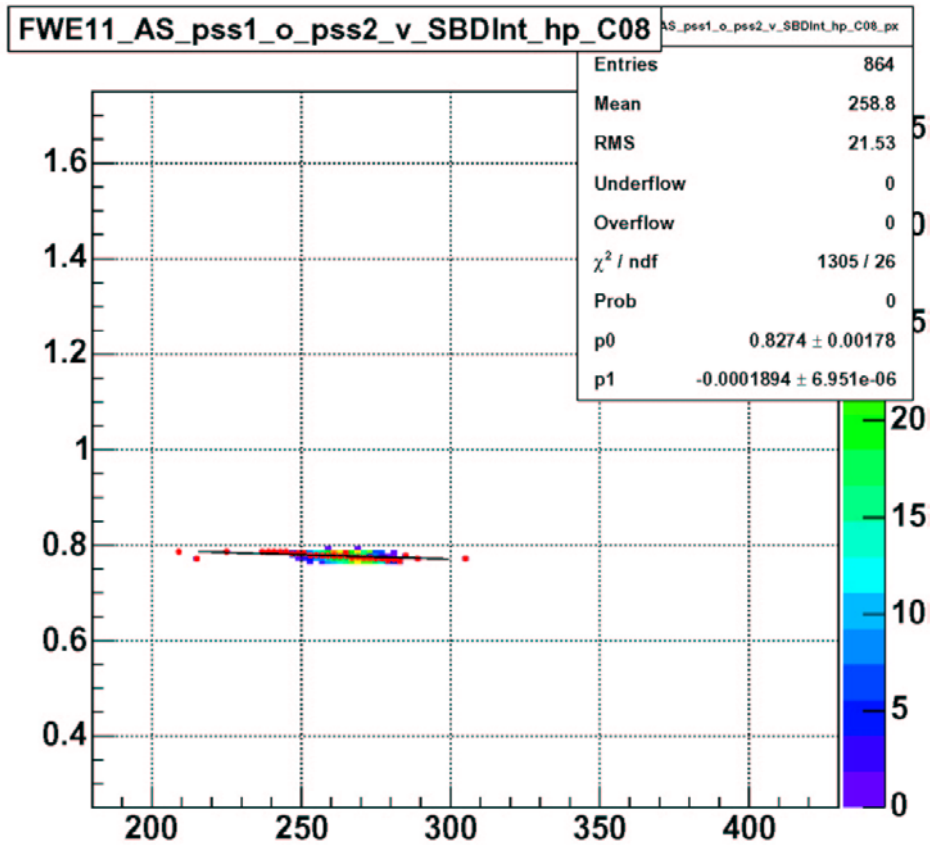
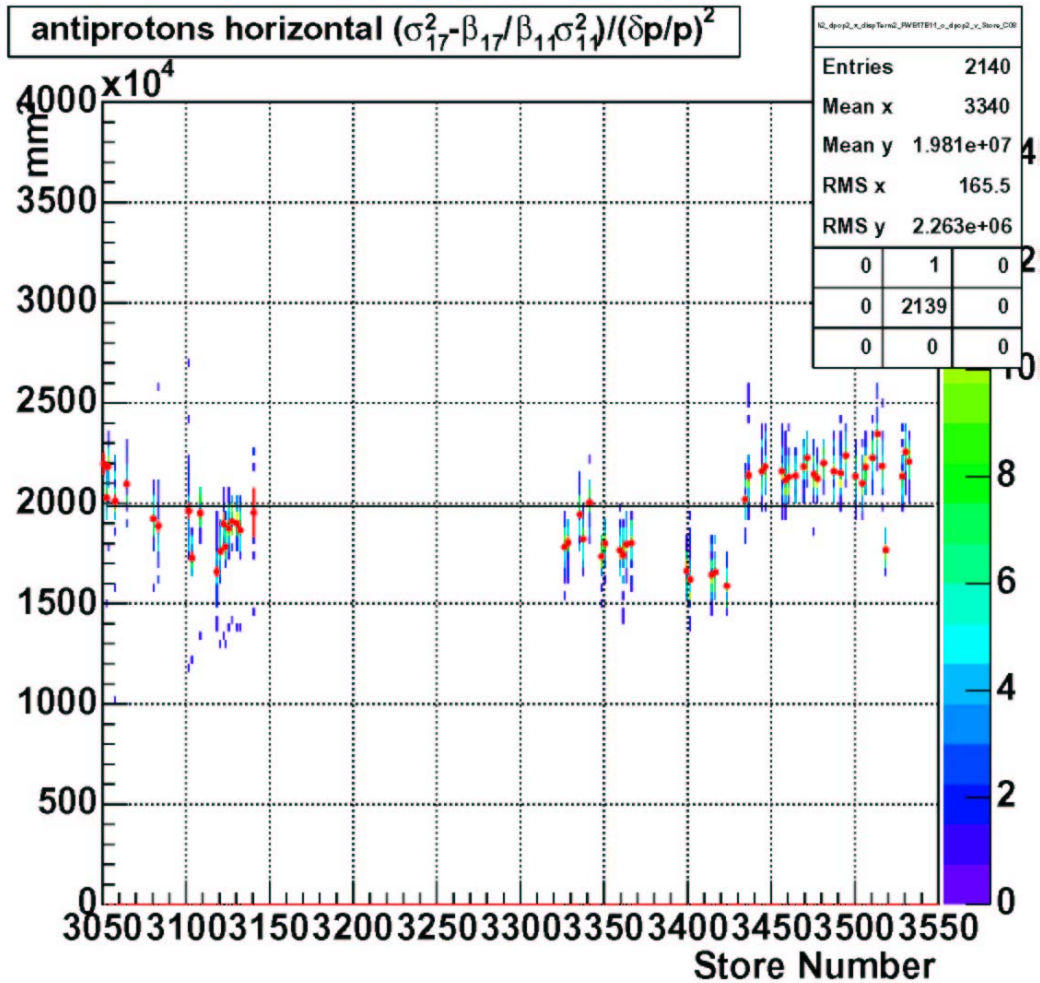


Ratio of pass 1 over pass 2 of Bunch Amplitude*Sigma versus SBDintensity for horizontal proton detector at 150 GeV.

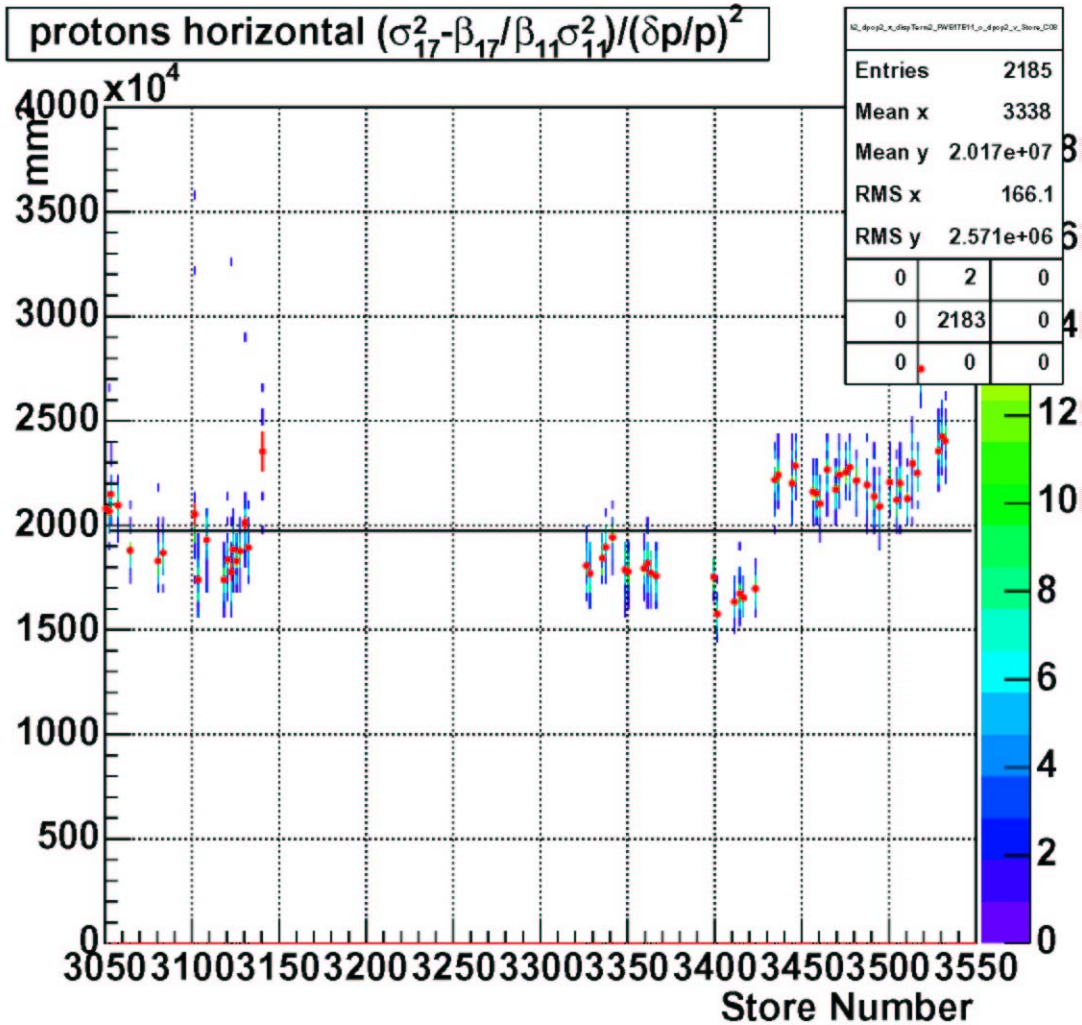
Injection Lattice Changes (pbars)

- Store 3424 lattice change is seen by horizontal Flying Wires

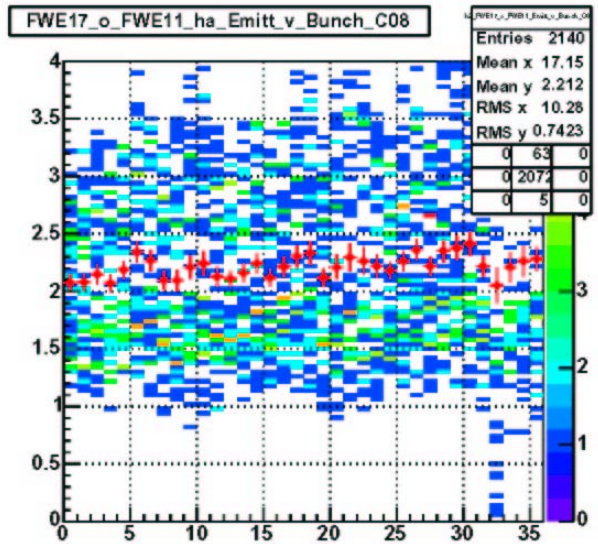


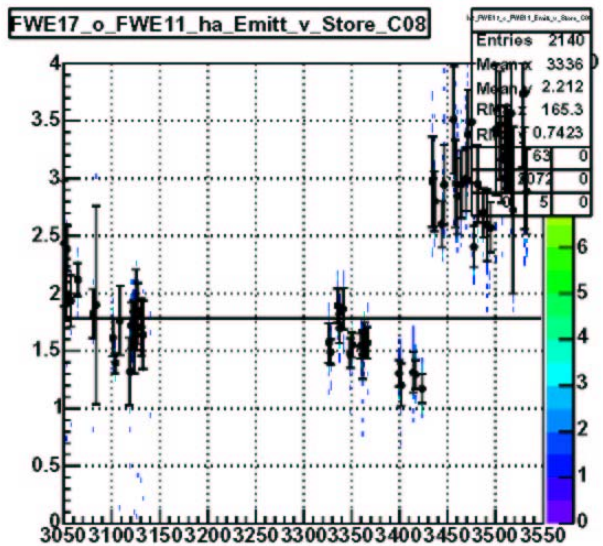
Injection Lattice Changes (protons)

- Store 3424 lattice change is seen by horizontal Flying Wires;
- Proton detectors indicate another smaller change before store 3528 (due to RF change?)



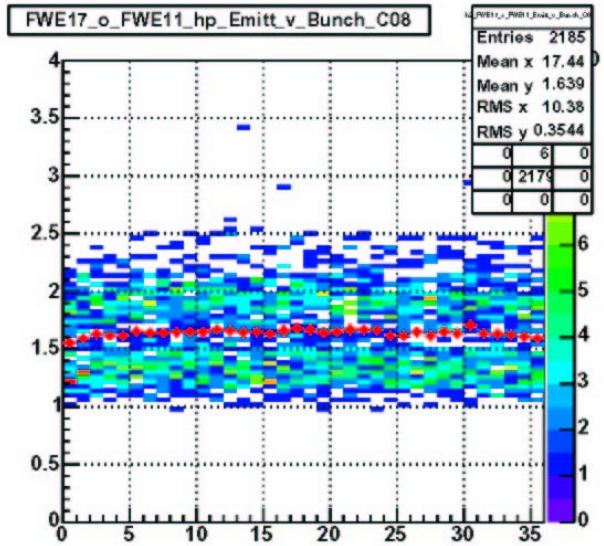
Injection Lattice Changes (pbars)

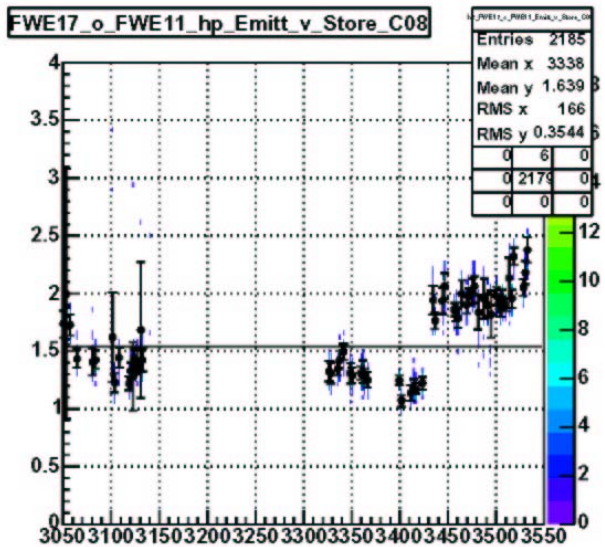




The ratio of E17/E11 Emittances not equal one indicates a discrepancy in the lattice functions

Injection Lattice Changes (protons)

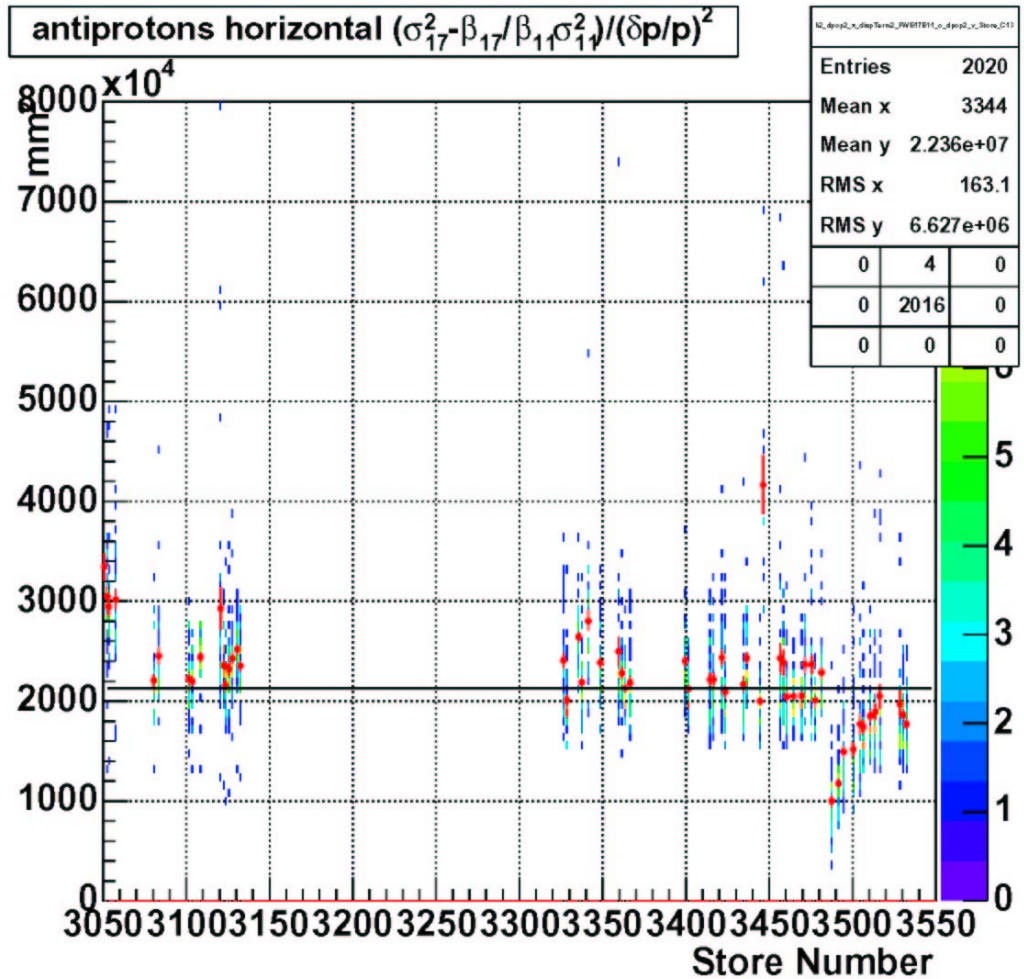




The ratio of E17/E11 Emittances not equal one indicates a discrepancy in the lattice functions

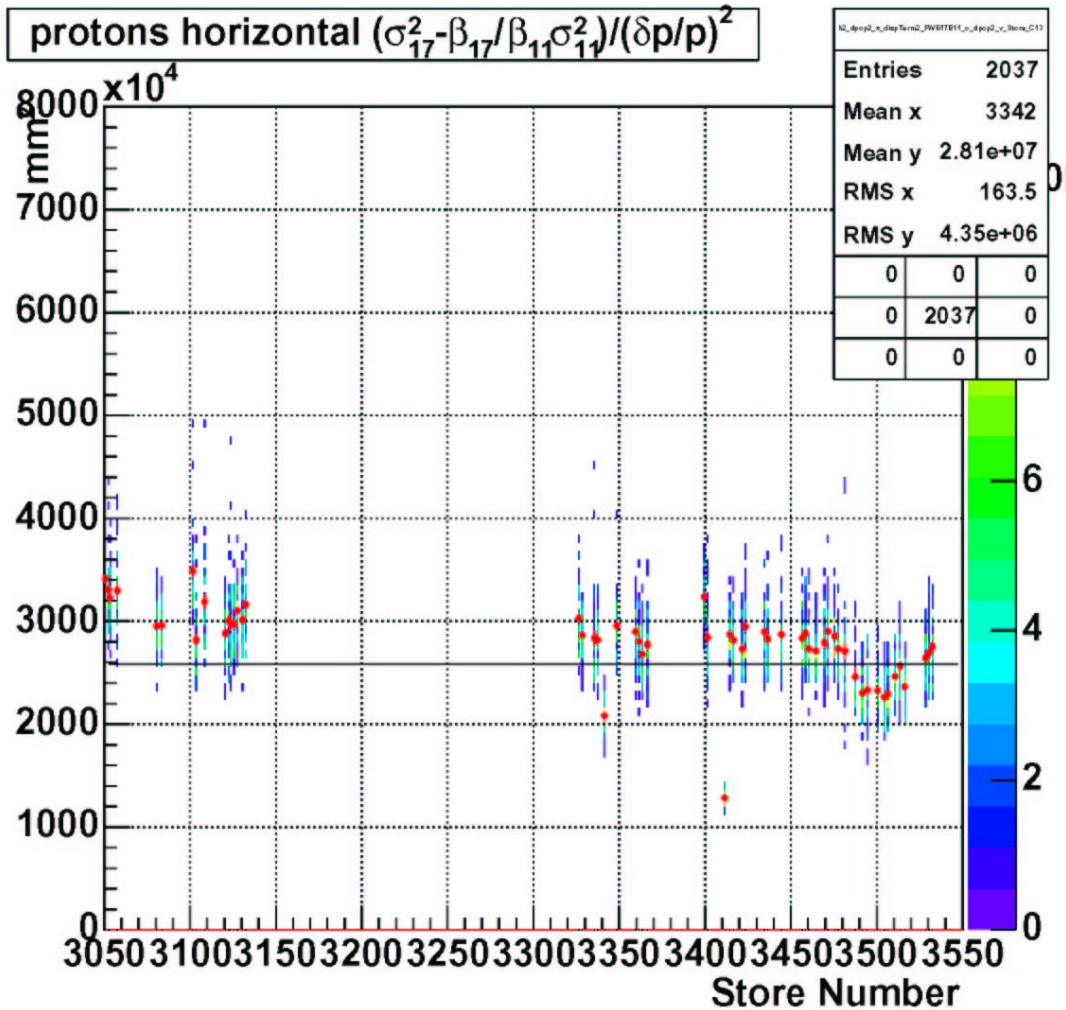
Collision Lattice Changes (pbars)

- A change is visible before store 3487 with changes afterwards?
- A change before store 3528?

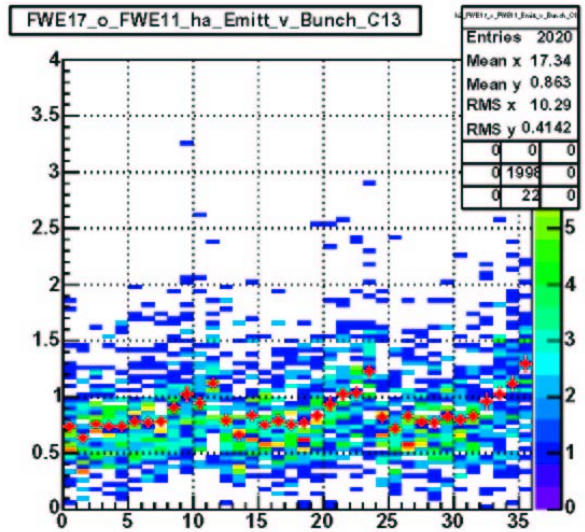


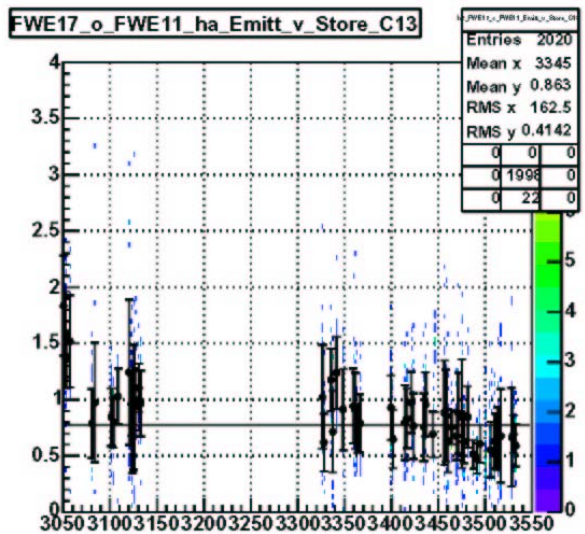
Collision Lattice Changes (protons)

- Store 3487 lattice change is seen by horizontal Flying Wires;
- Proton detectors indicate another change before store 3528 (most likely due to RF change not accounted for in the current dp/p formula)



Collision Lattice Changes (pbars)





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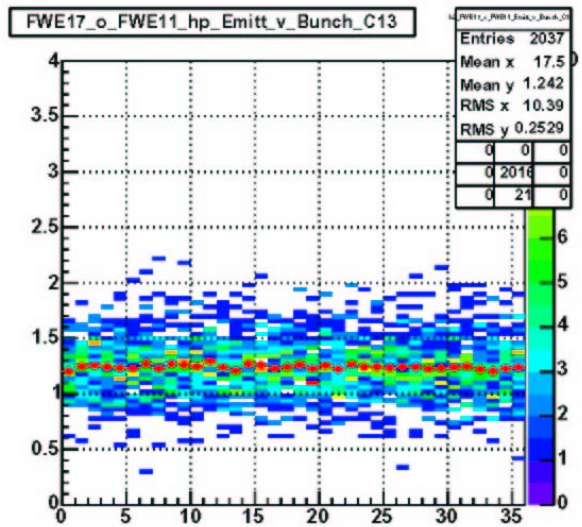
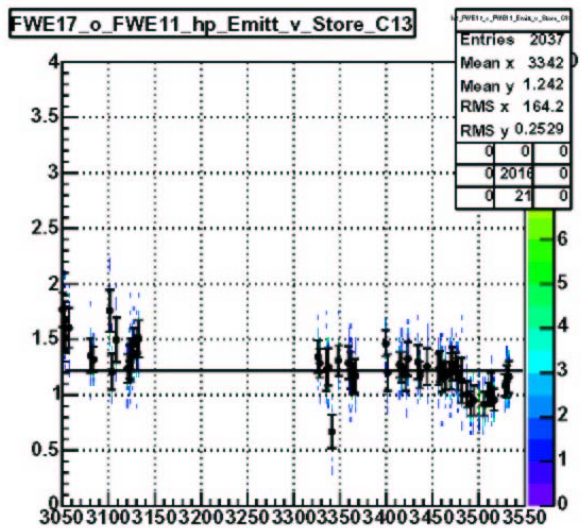
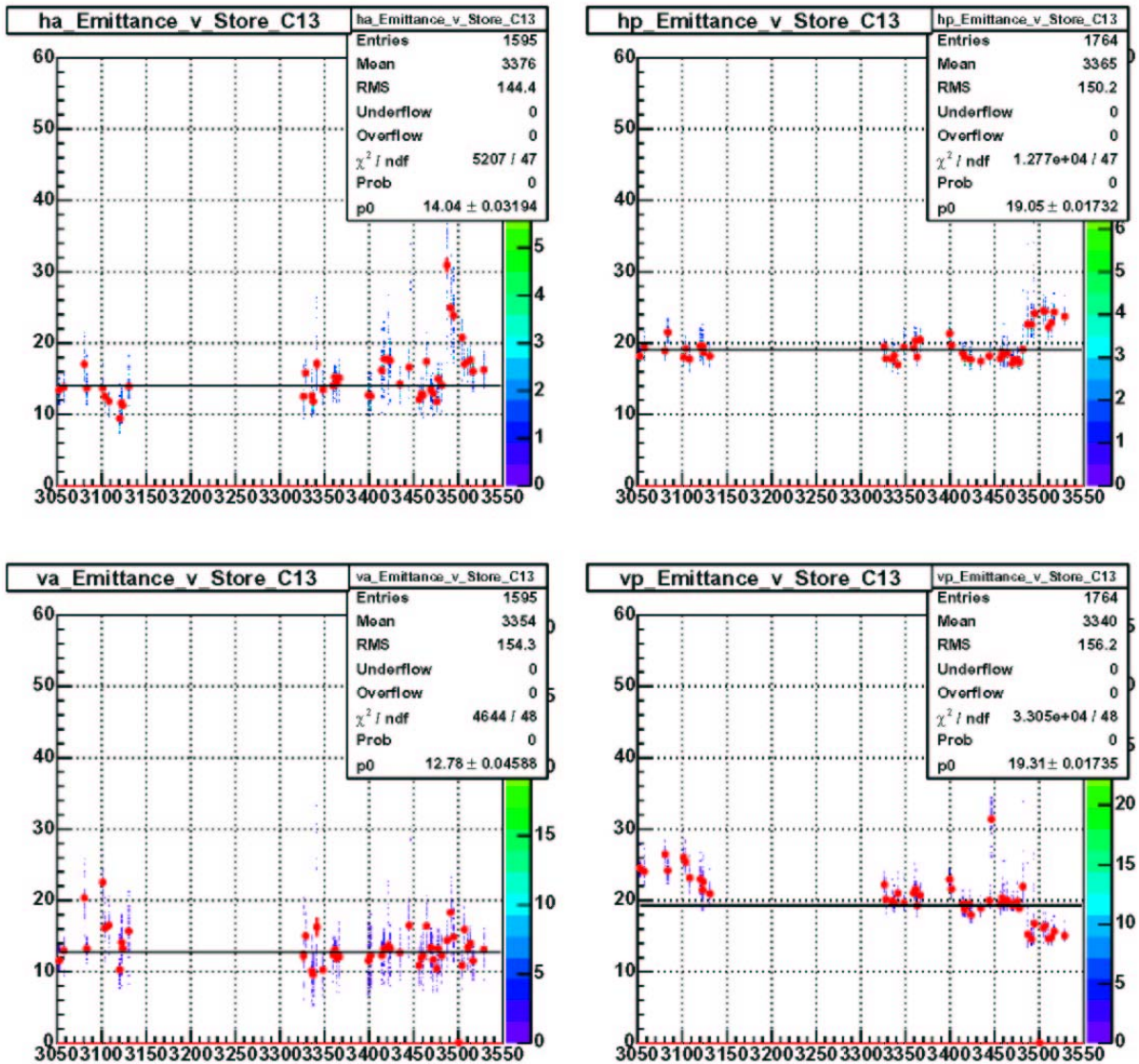
Collision Lattice Changes (protons)





The ratio of E17/E11 Emittances not equal one indicates a discrepancy in the lattice functions

Collision Lattice/Emittance Changes



Flying Wires see lattice changes

- Both Injection and Collision lattice changes are visible using Flying Wires measurements
- The changes seem to be different for protons than for pbars