Cleaning Blowup

L.R. Carver, X. Buffat

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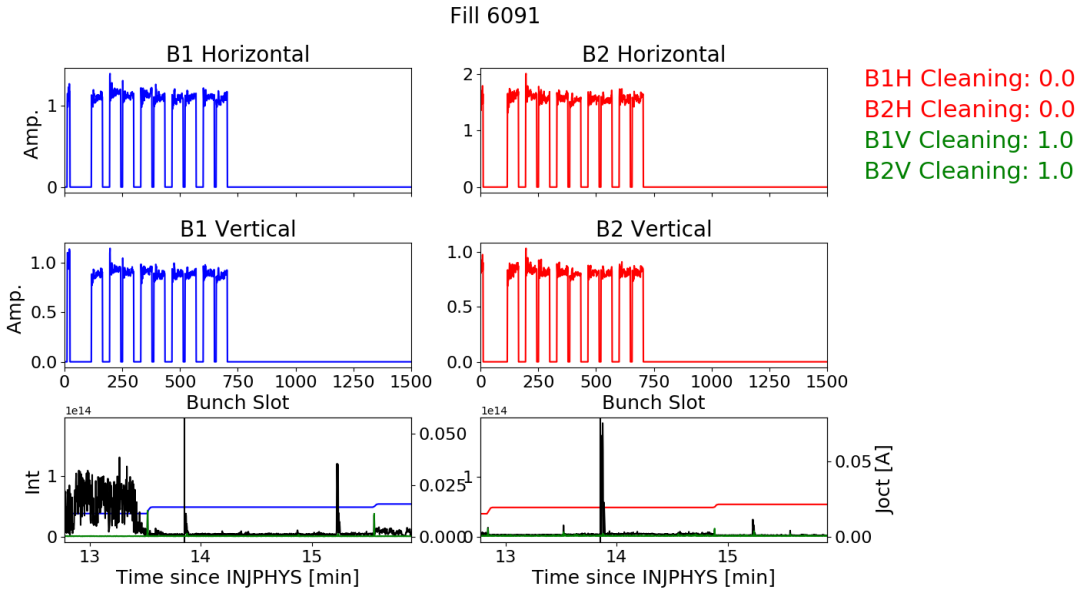
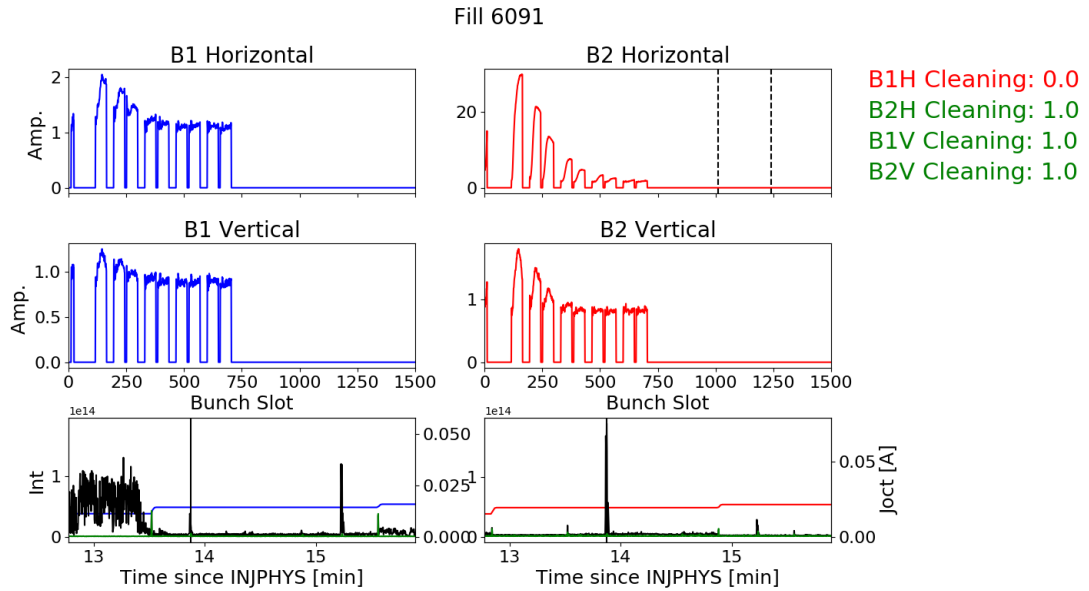
Introduction

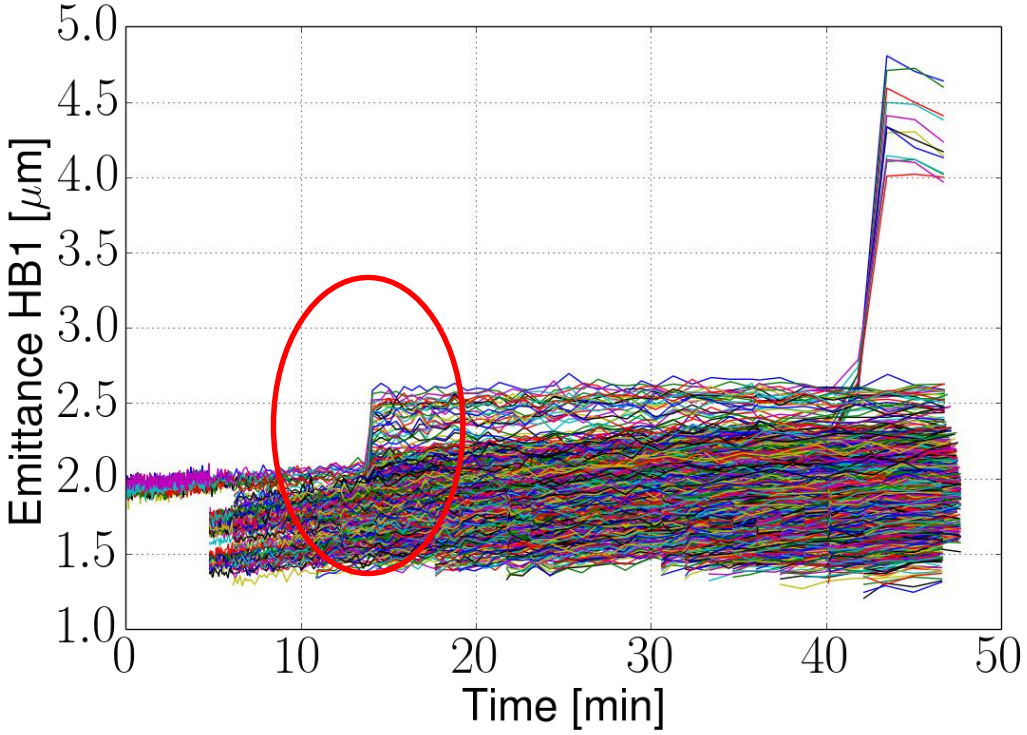
- In past presentations it has been shown that the injection cleaning causes a strong kick to circulating bunches.
- Typically seen (with nominal 25ns beam, 96-144bpi) to occur around the 5th or 6th batch injection.
- Strong correlation with the cleaning. Shown below is before and after cleaning in B2H is switched on. Happens in both beams.
- Does it have an impact on emittance?

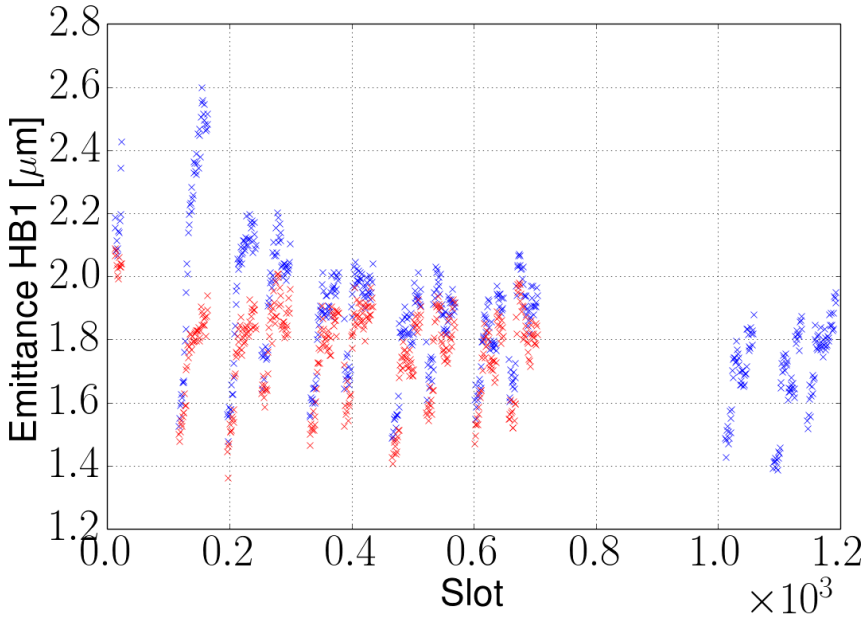




Emittance

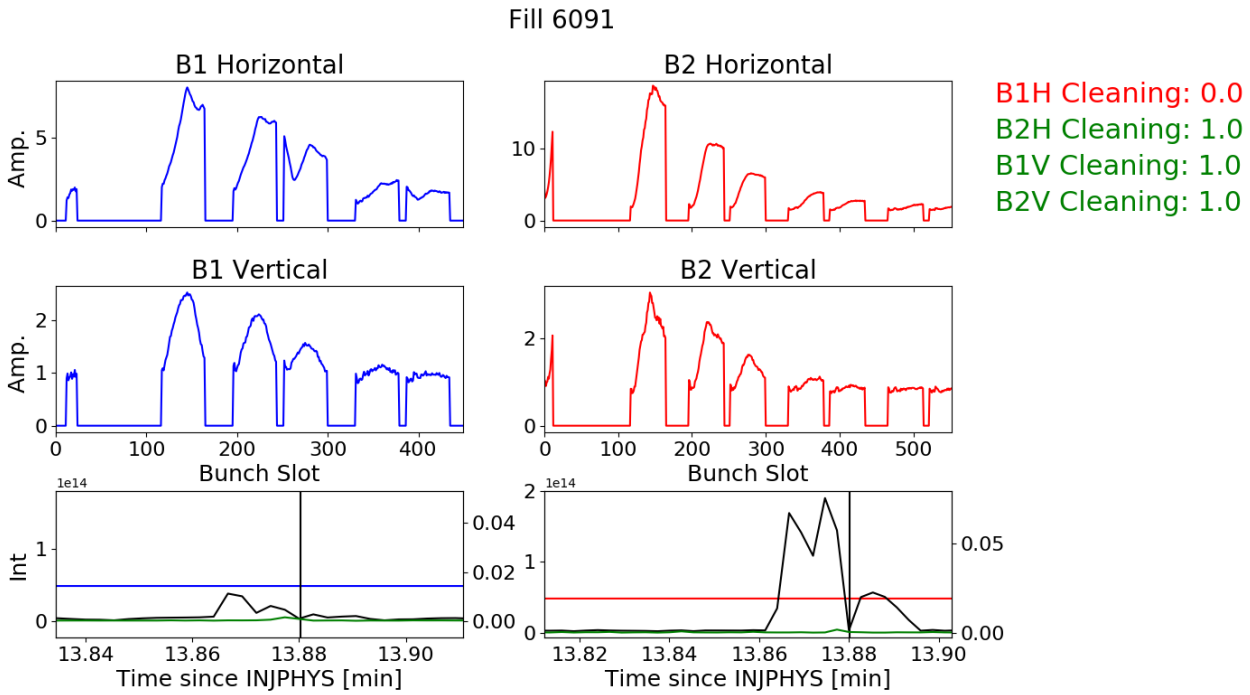
- Does it have an impact on emittance?
- Yes but by a small amount. Difficult to see when viewing BSRT vs bunch slot as it blends in with other blown up bunches.

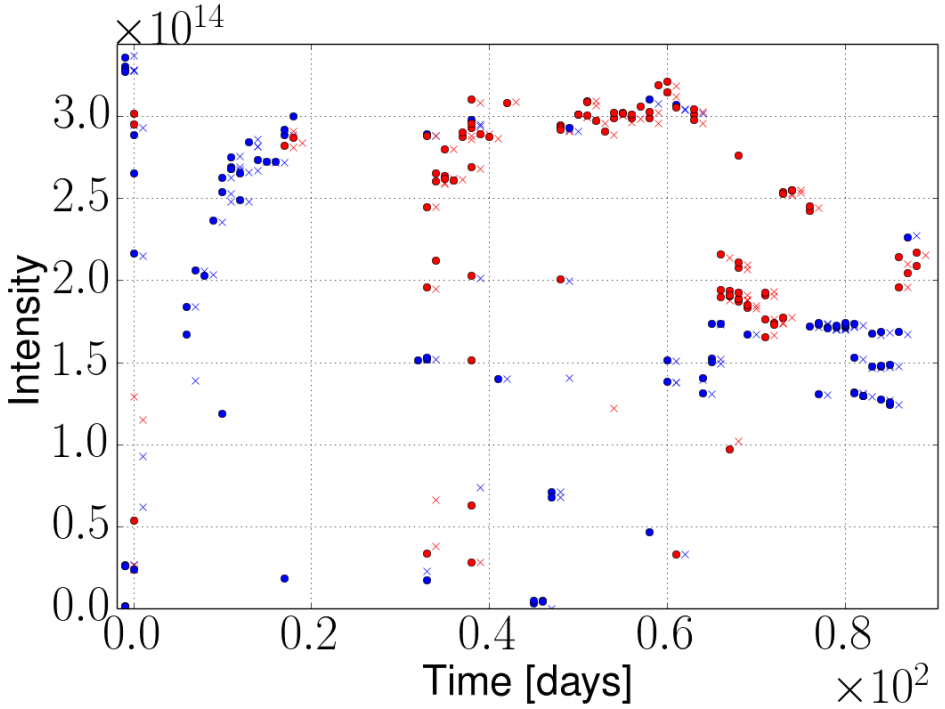


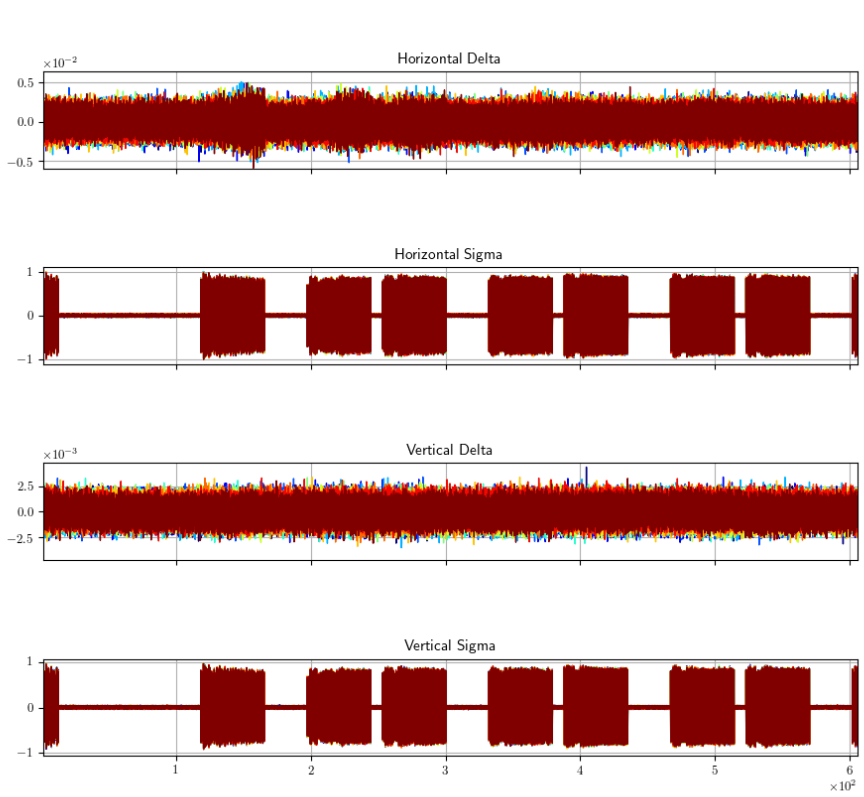


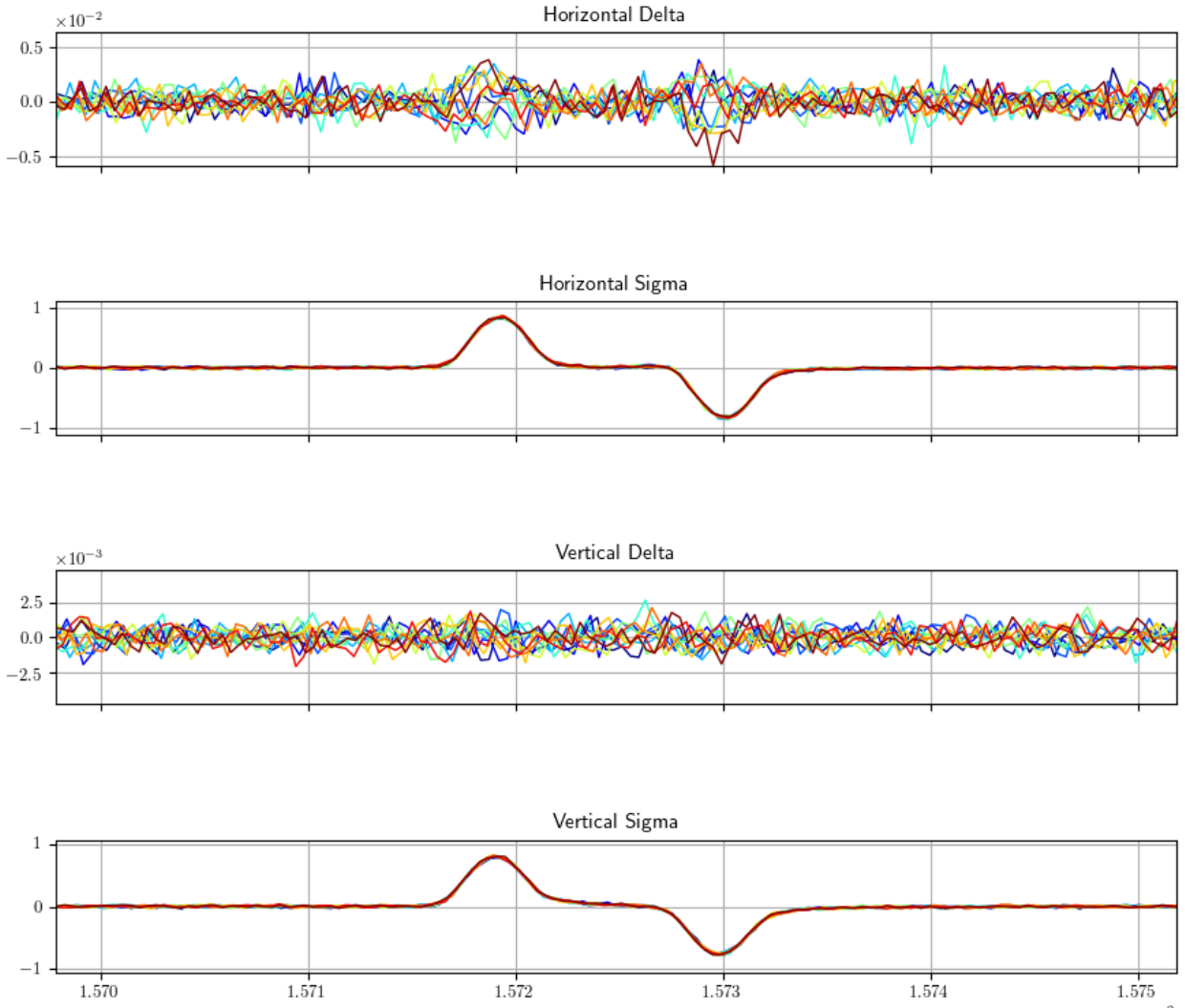
Causes

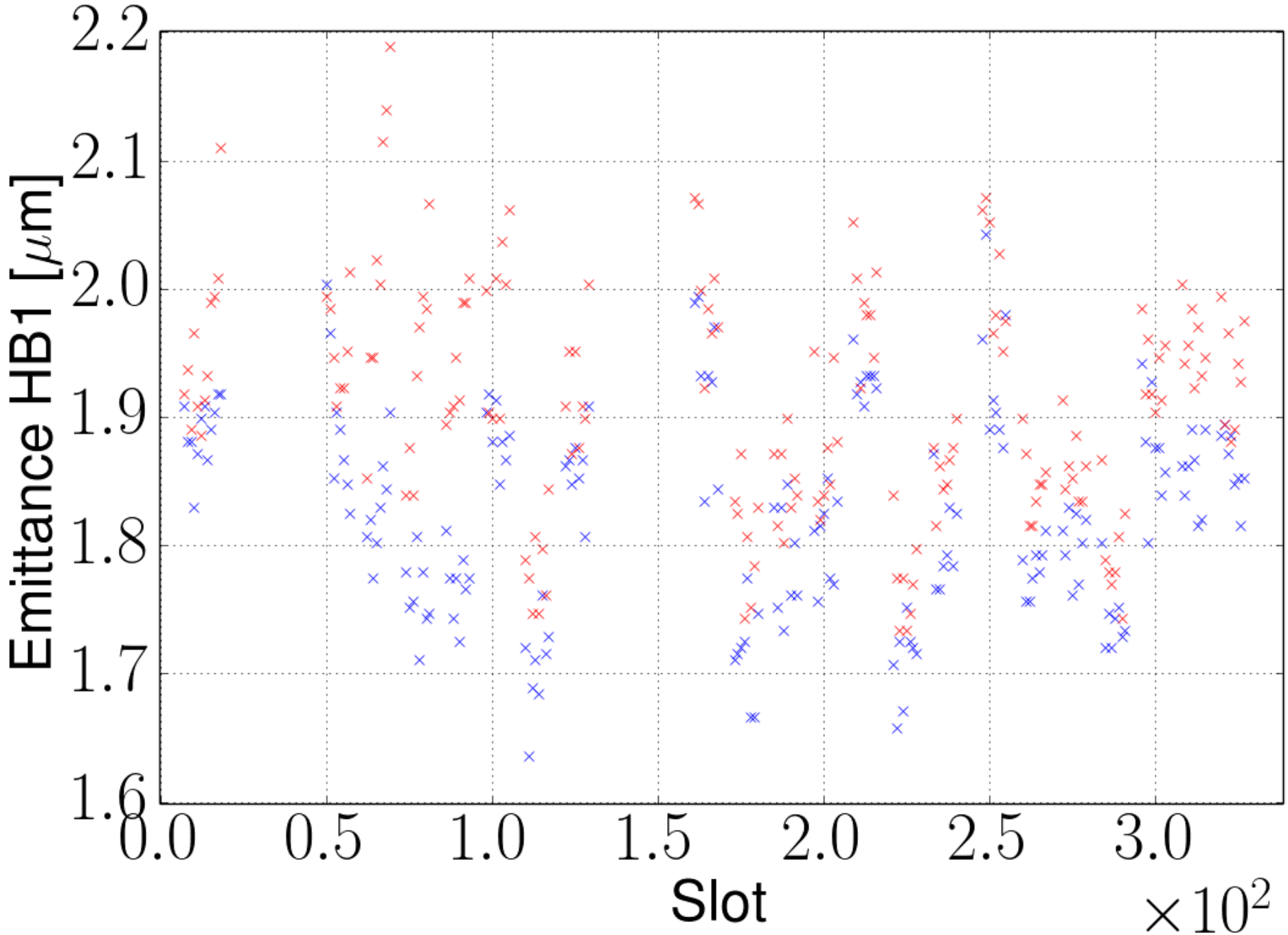
- Possible causes? Excitation amplitude follows an approximate ecloud shape on B2, (B1 would depend on ecloud + beambeam)
- For plot on right, fills with emittance blowup from cleaning are in red. Fills without are in blue.
- For 8b4e the emittance blowup is still present but smaller.
- How is the ADT witness region implemented? Possibly a kick on all bunches but only the ones with lower ADT gain react.






Horizontal Delta
×10⁻²
0.5
0.0
−0.5
Horizontal Sigma
1
0
−1
Vertical Delta
×10⁻³
2.5
0.0
−2.5
Vertical Sigma
1
0
−1
1
2
3
4
5
6
×10²


Horizontal Delta
×10⁻²
0.5
0.0
−0.5
Horizontal Sigma
1
0
−1
Vertical Delta
×10⁻³
2.5
0.0
−2.5
Vertical Sigma
1
0
−1
1.570
1.571
1.572
1.573
1.574
1.575


Emittance HB1 [μm]
2.2
2.1
2.0
1.9
1.8
1.7
1.6
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Slot
$\times 10^2$