

E-lens related beam studies

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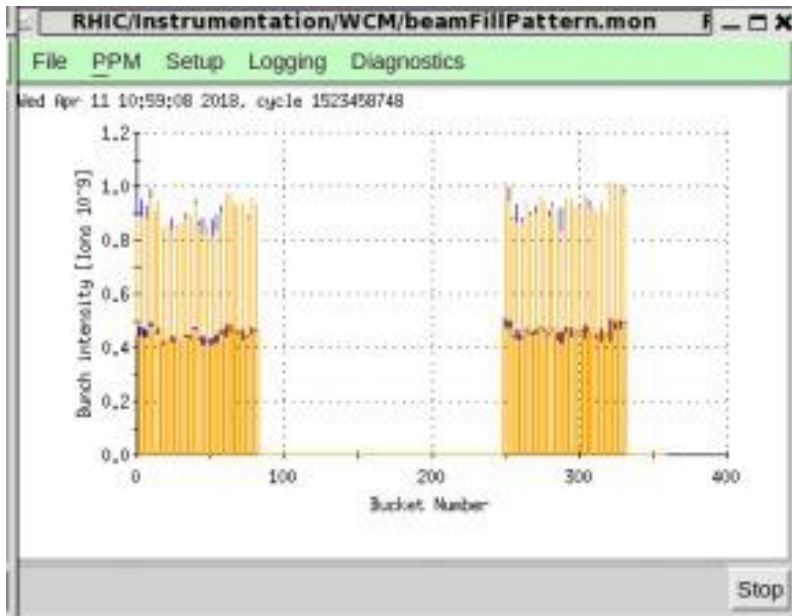
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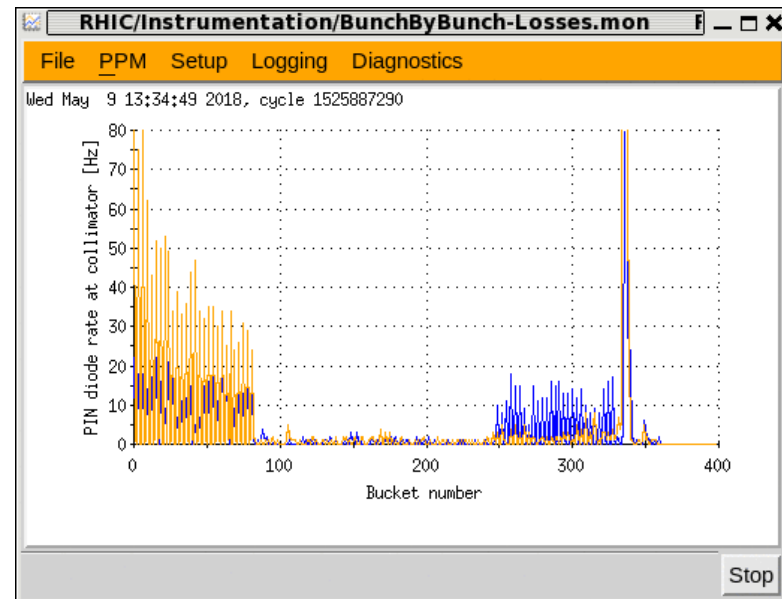
APEX Summary

1. We did beam alignment between e-beam and ion beam for transverse planes and angle. The angle was changed +/-0.07 mrad for both planes, didn't find eBSD signal change. The aligned orbit was captured.
2. Collimator was brought closer to beam for beam loss. see [here](#)
3. The radius of e-beam was scanned from 6 sigma to 3.5 sigma. The first bunch train can see more beam loss than the second bunch train. will do emittance analysis offline to see whether emittance has changed.
4. The current of e-beam was scanned from 300mA to 680mA as well.
5. It is found, with the load pattern, only the second bunch train has collision. Created new pattern for next time. see [here](#)
6. Tried to measure beam profile with ion beam close to the edge of e-beam at the end of e-lens APEX, lisa didn't sent out the bump command, see [here](#)
7. IPM bucket number scan for better emittance measurement.

Bunch Train 1 and Bunch Train 2

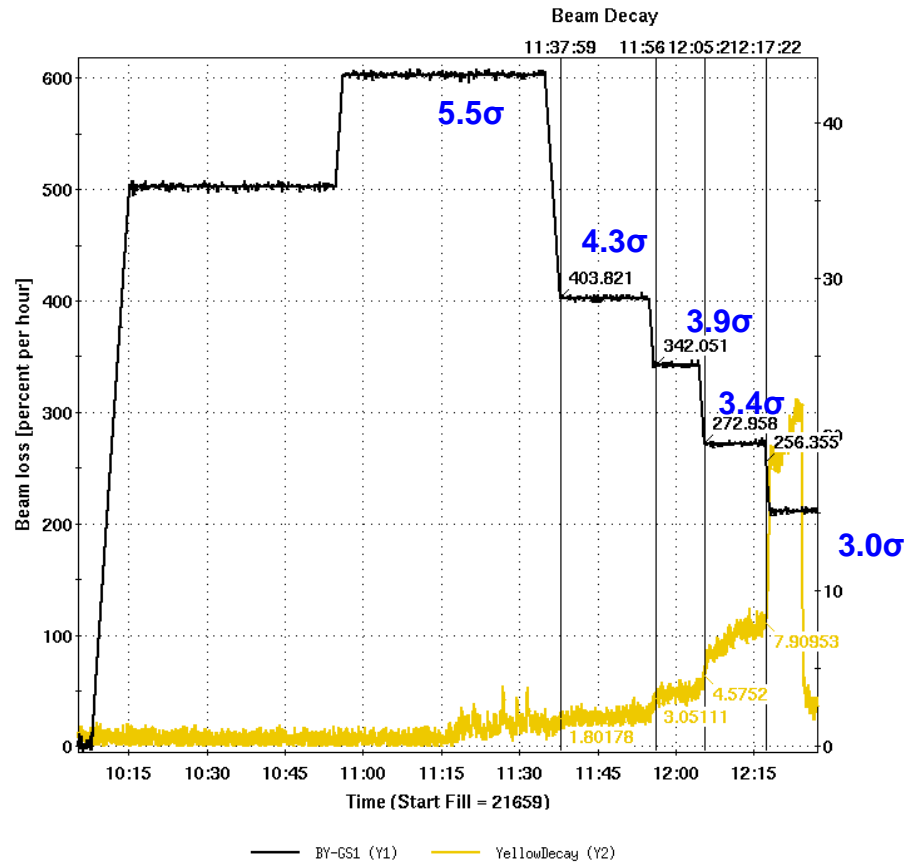


e-beam only interacts with train 1

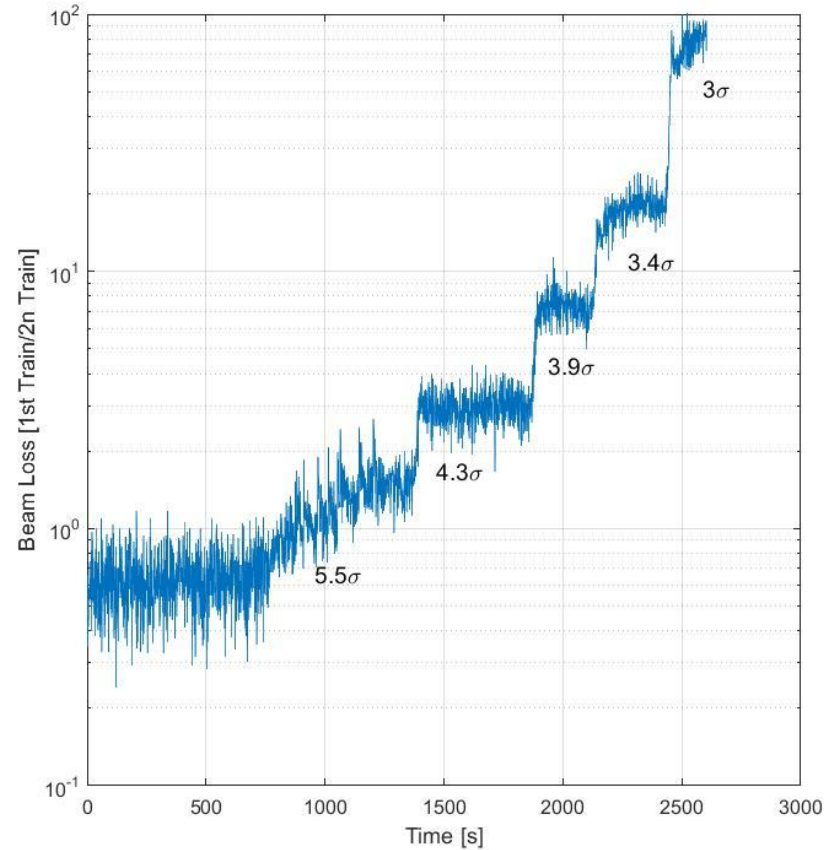


Radius Scan with 270 mA

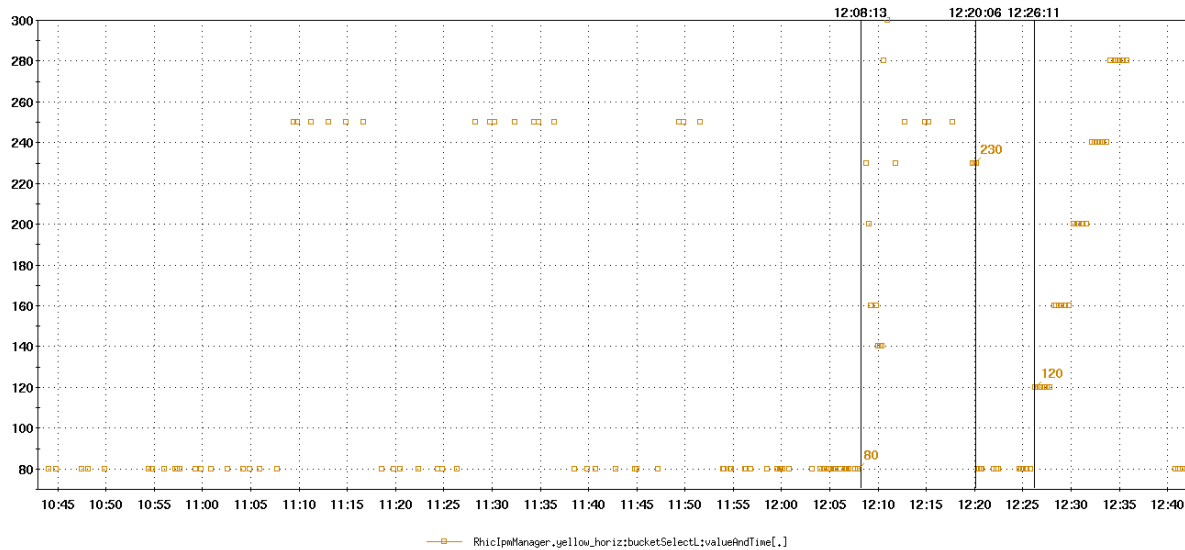
e-beam size vs beam decay (train1+ train2)



BBB loss ratio: train1/train2

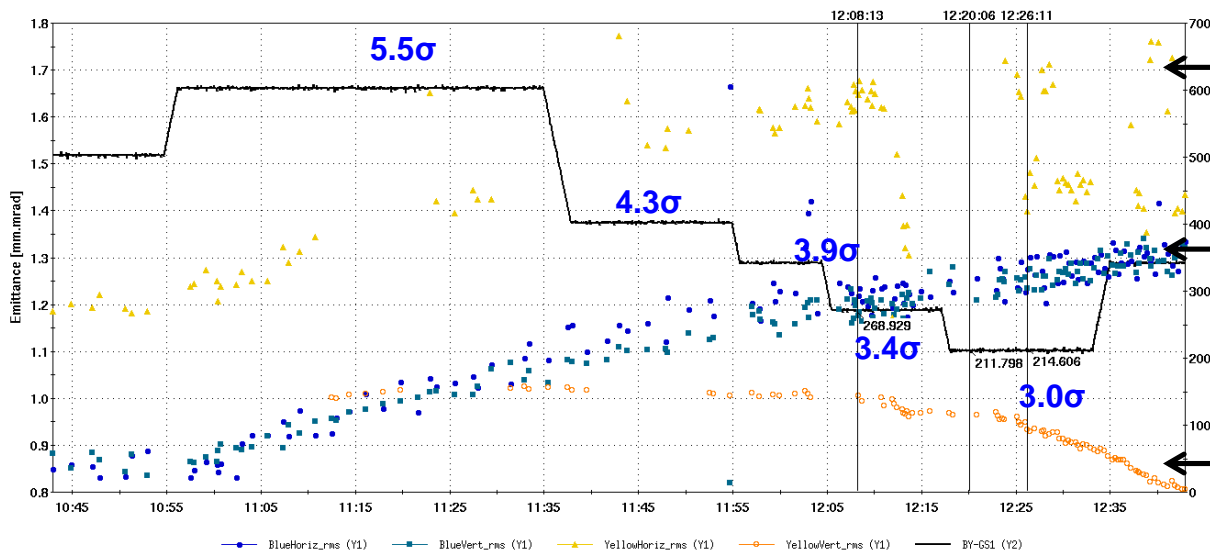


Radius Scan with 270mA



240 or 250:train2 emittance

80:train1 emittance



Yellow Emittance H

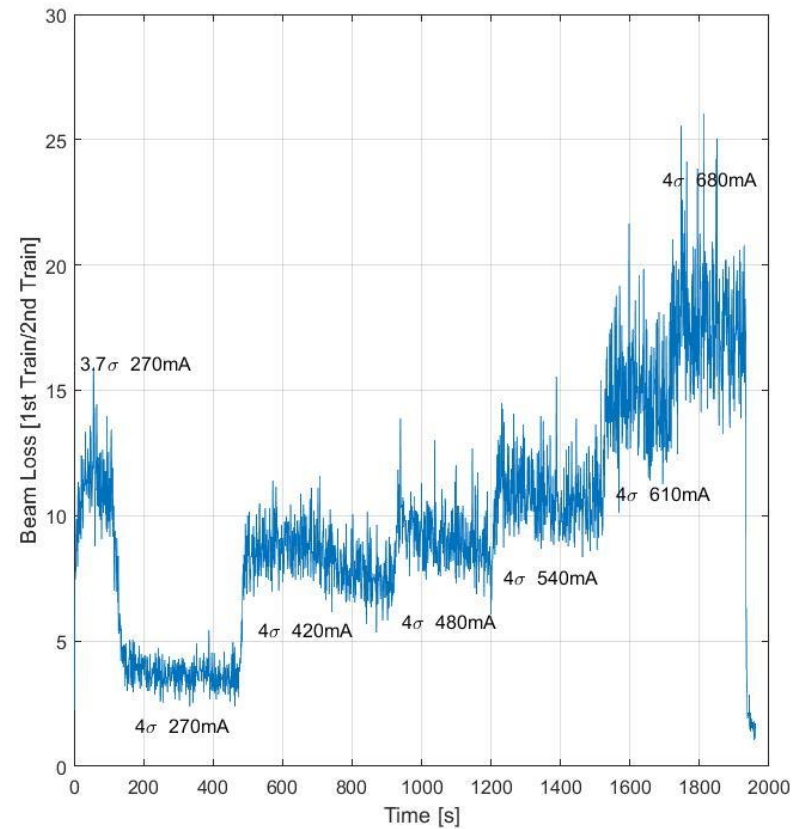
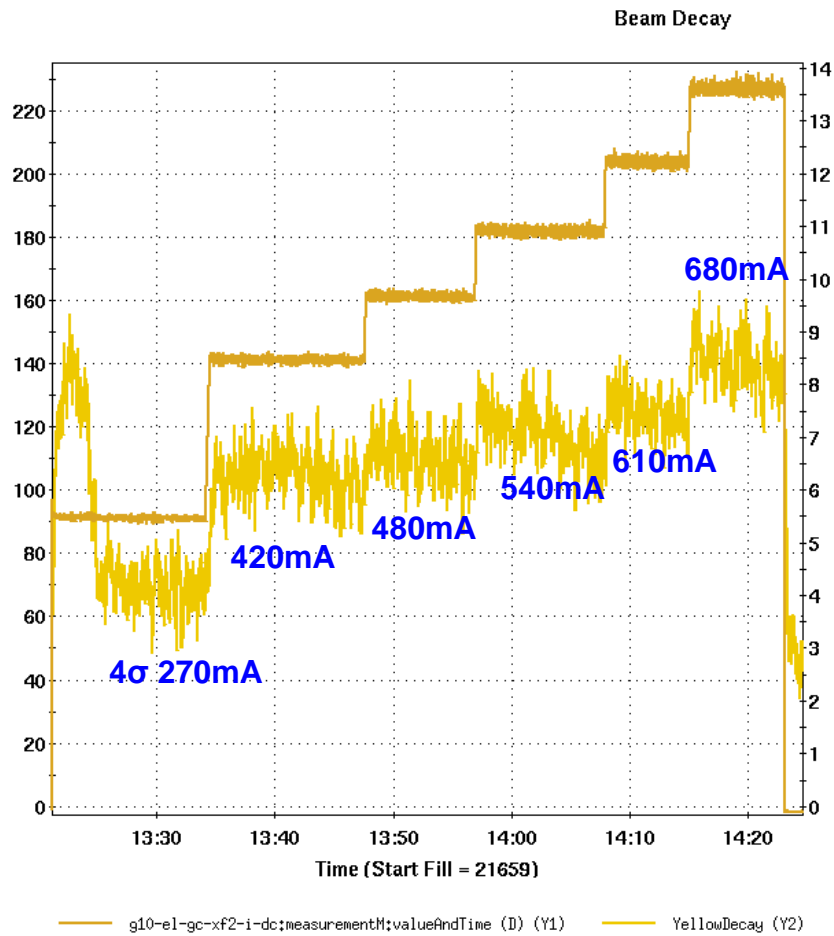
Blue Emittance H&V

Yellow Emittance V

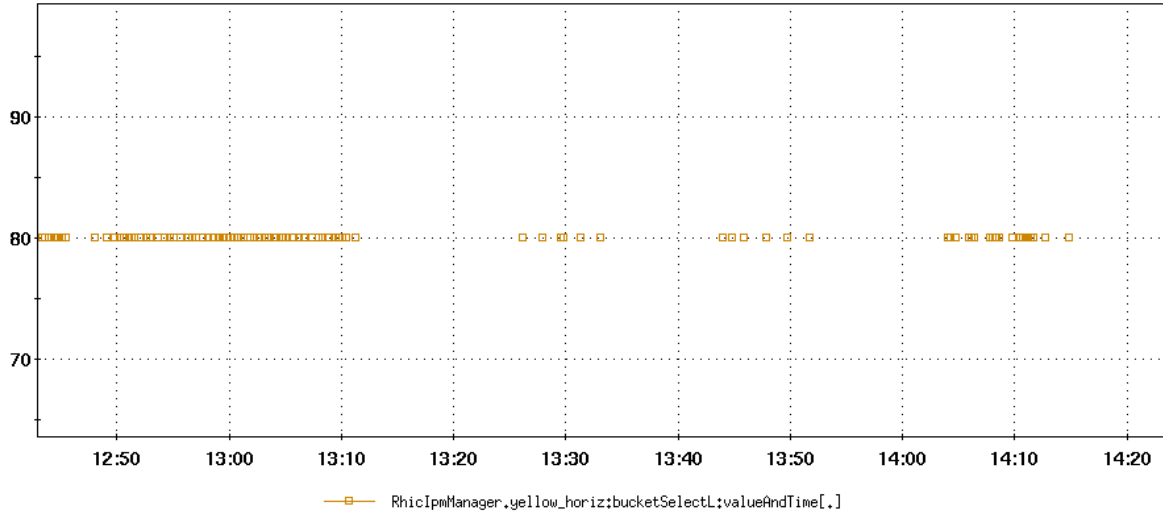
Current Scan with 4 sigma

e-beam current vs beam decay (train1+ train2)

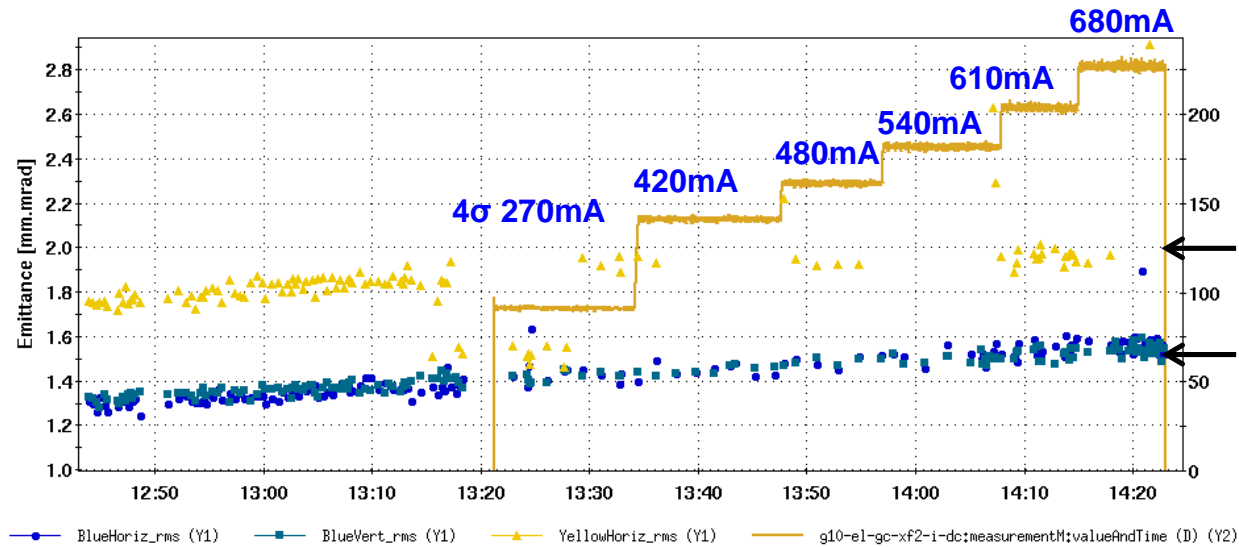
BBB loss ratio: train1/train2



Current Scan with 4 sigma



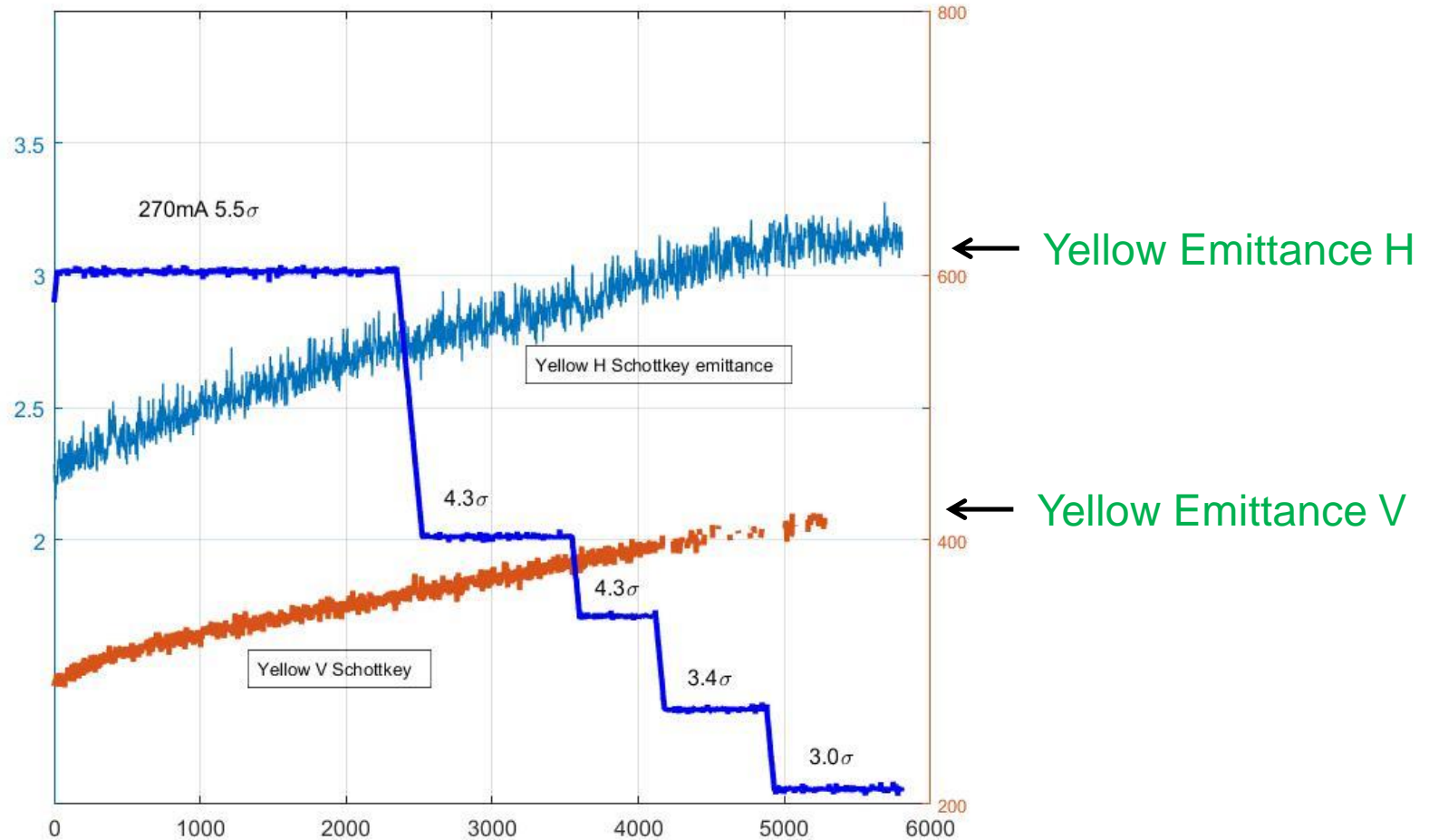
80:train1 emittance



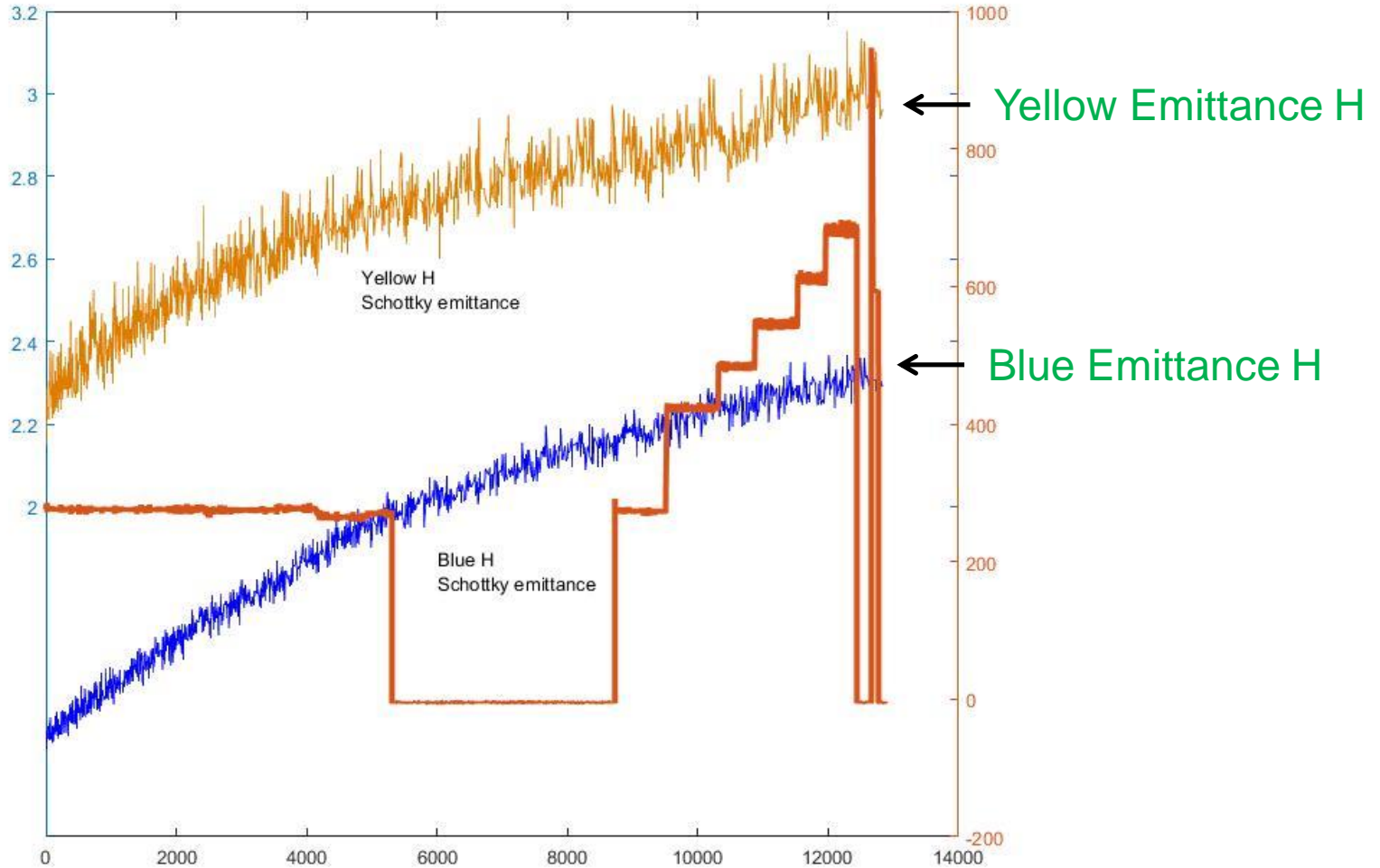
Yellow Emittance H

Blue Emittance H&V

Radius Scan Schottky Emittance

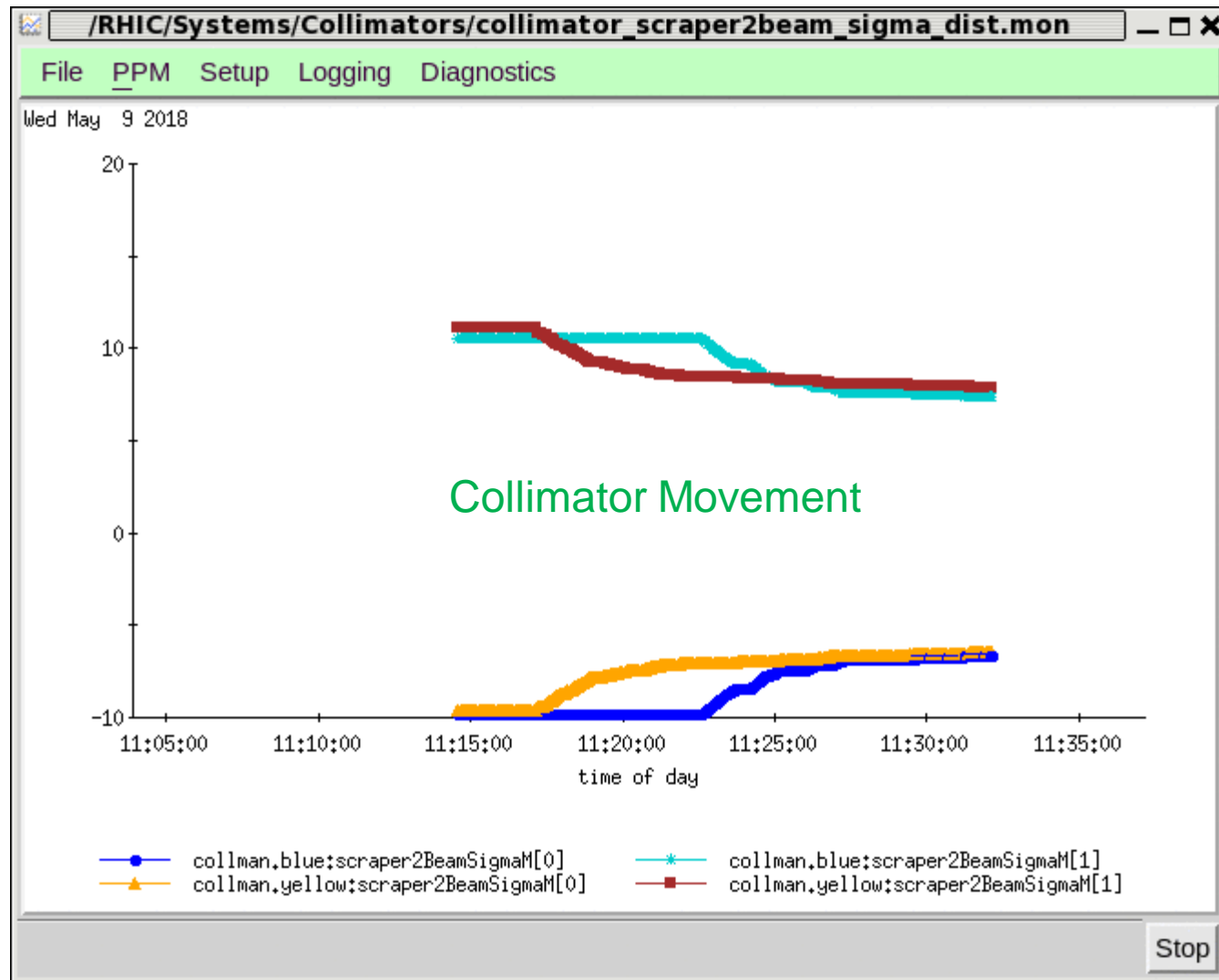


Current Scan Schottky Emittance



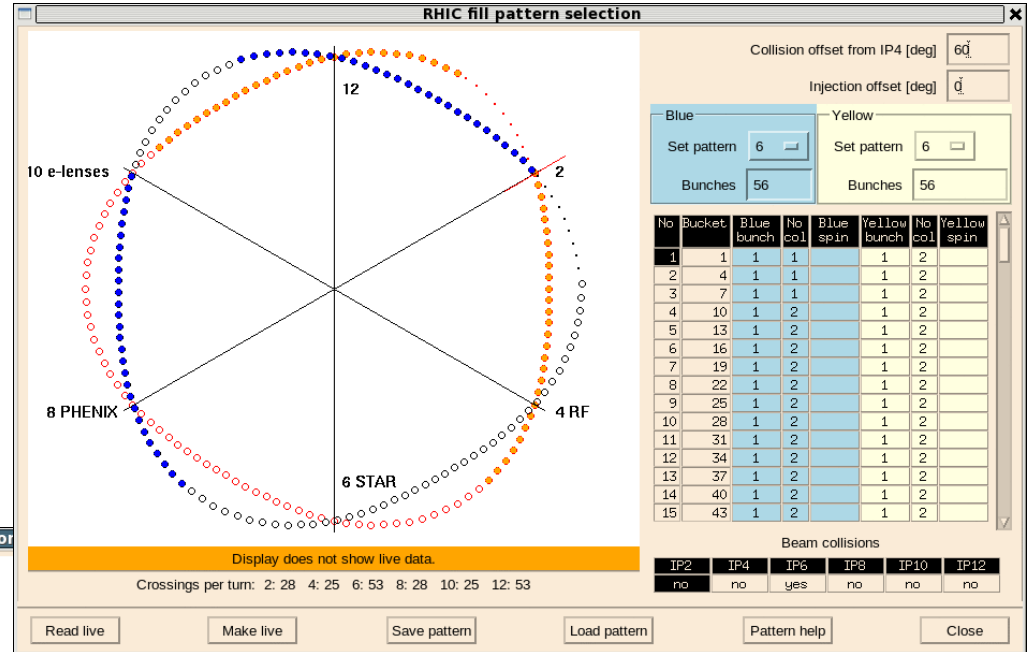
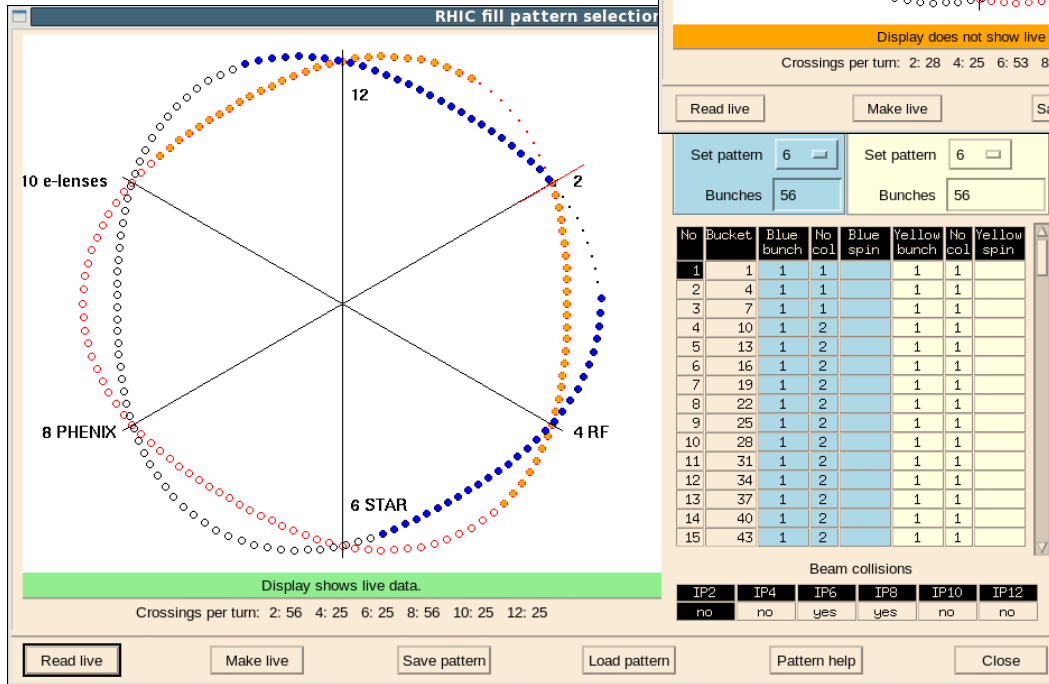
Schottky Emittance: all bunches

Collimator Position

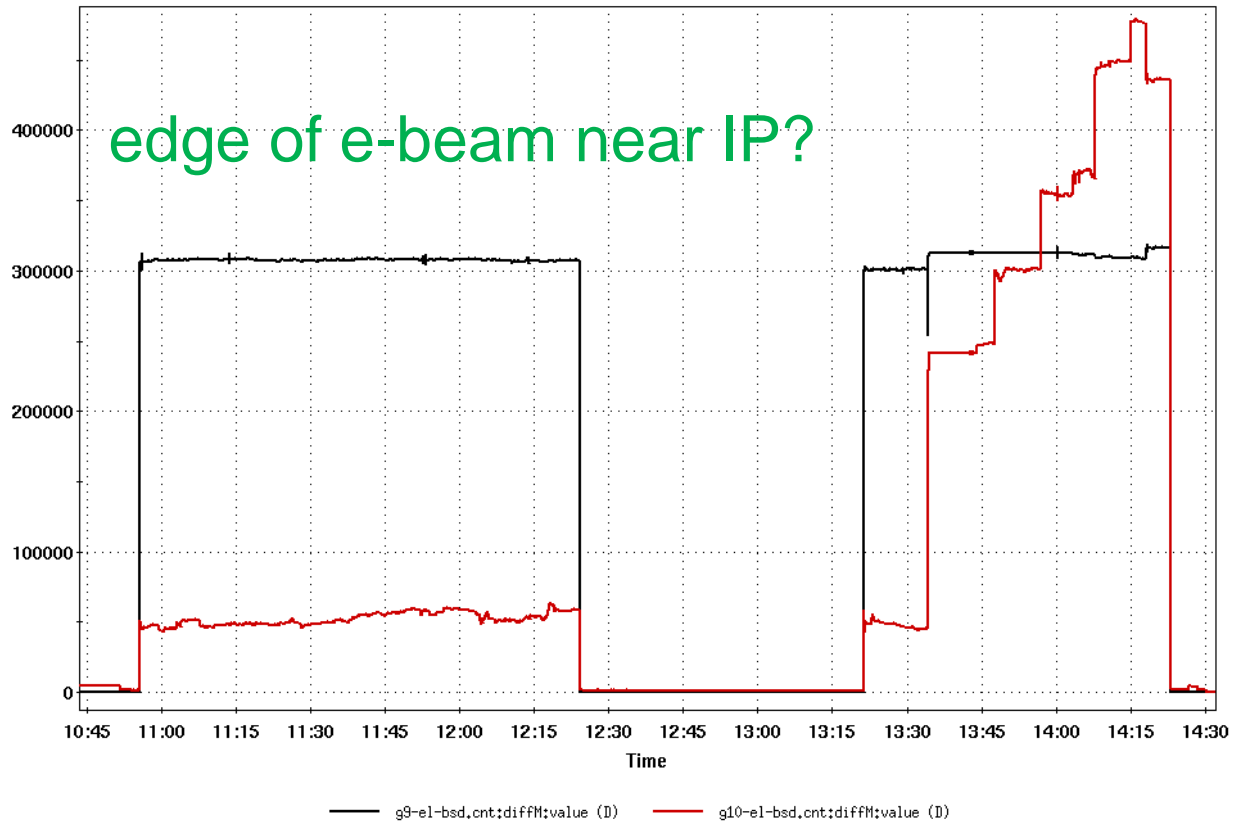


Fill Pattern

FillPattern



eBSD Blue and Yellow



IPM bucket number scan

