

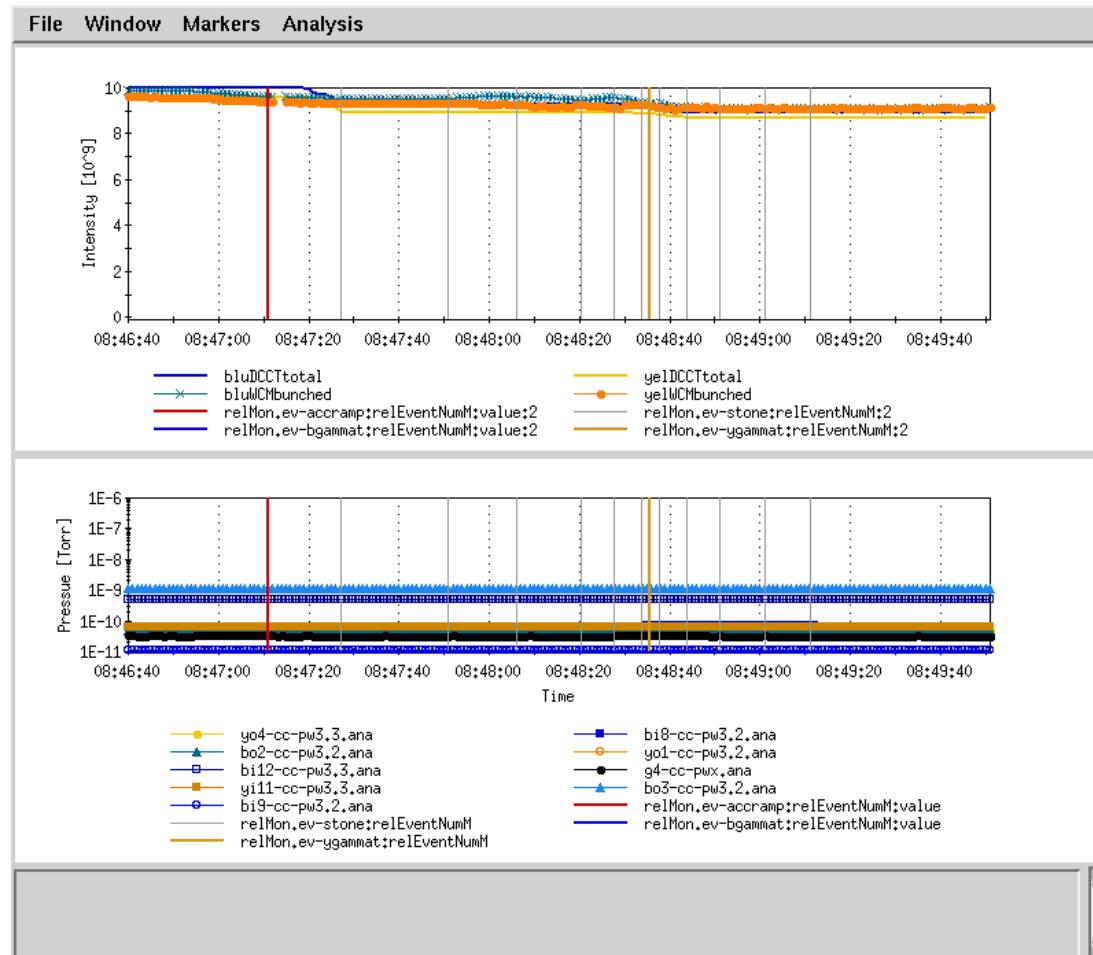
p-Au ramp test

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Introduction

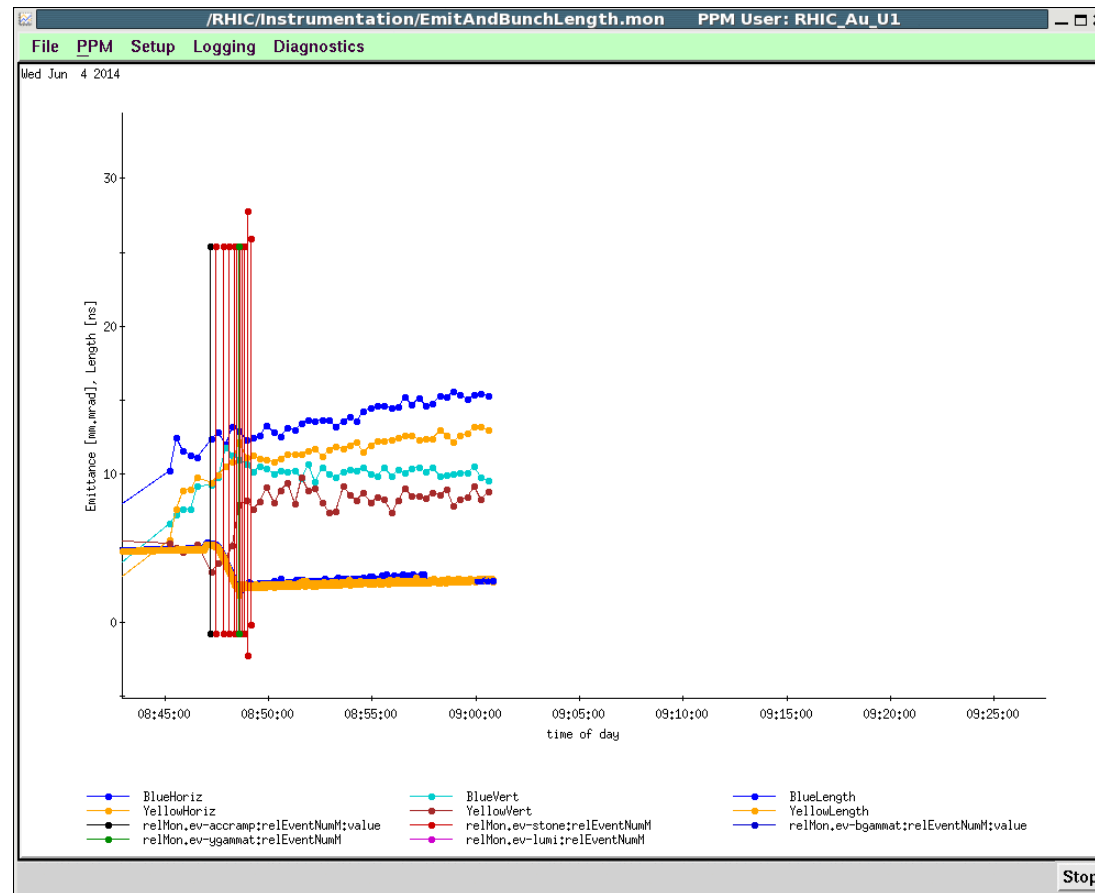
- p-Au ramp will require different revolution frequencies at injection for equal $B\rho$ in both rings, OR different injection γ for equal revolution frequencies
- For equal frequencies, inject Au first at $\gamma = 10.5$, then ramp through transition to $\gamma = 25.3$, inject protons, and ramp both rings to store
- Tested the “equal frequency scenario” during APEX

Ramp with 6x6 through transition



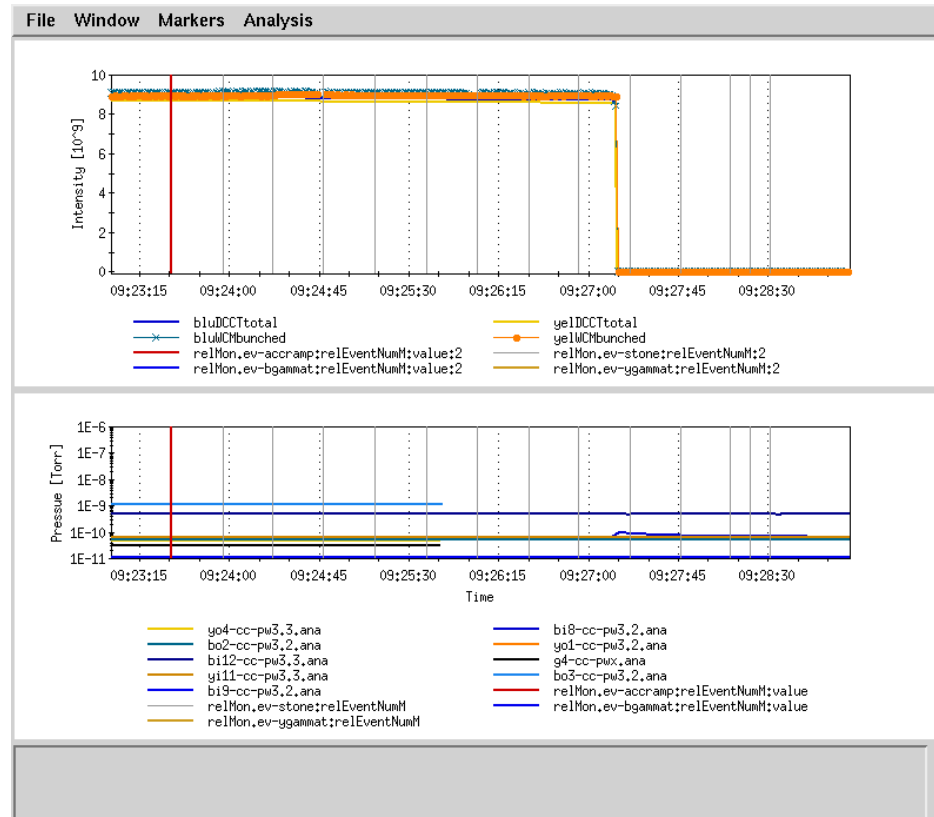
Low losses, comparable to regular ramp

Emittances and bunch length on proton injection porch



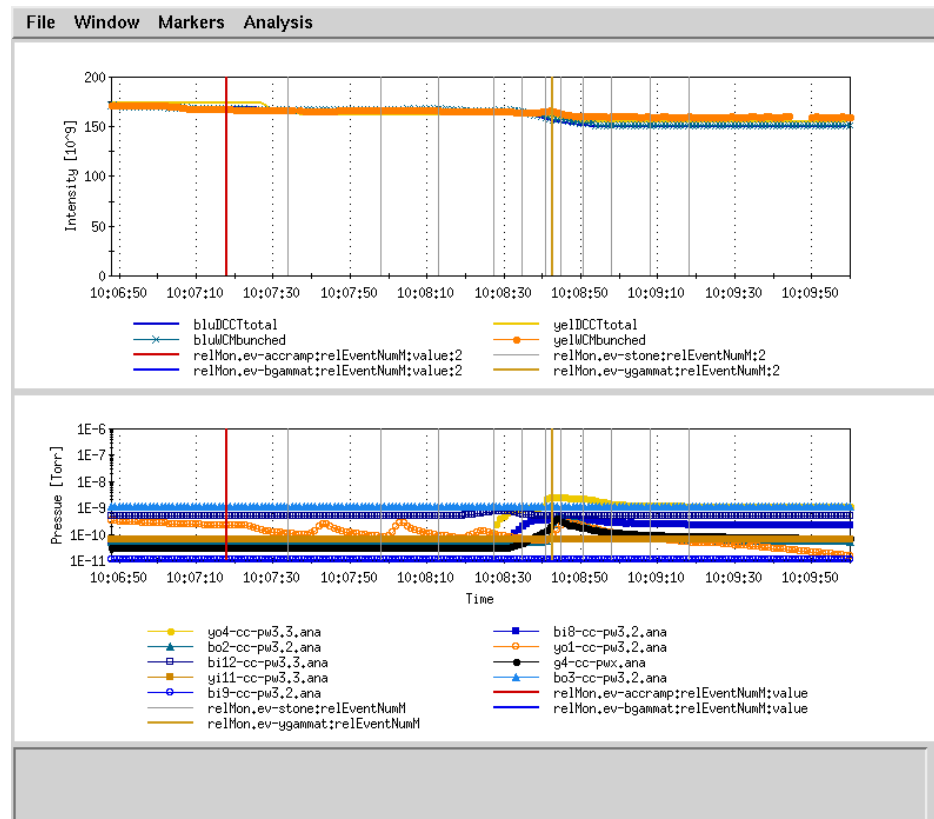
Some bunch lengthening and horizontal emittance growth due to IBS

Ramp with 6x6 from transition to flattop



Low losses until beam is lost due to FEC reset/orbit feedback problem

Ramp with 111x111 through transition



Low losses, comparable to regular ramp
No signs of longitudinal multi-bunch instability on proton injection porch

Conclusion

- Au beams with $1.6 \cdot 10^9$ ions/bunch were successfully ramped as required for p-Au operations at equal frequencies
- Emittance growth on proton injection porch at $\gamma = 25.3$ is minor
- No signs of a longitudinal multi-bunch instability - our greatest worry
- Acceleration from $\gamma = 25.3$ to store worked flawlessly; beam loss later in the ramp was due to FEC reboot
- “Equal frequency scenario” is the way to go in FY2015