

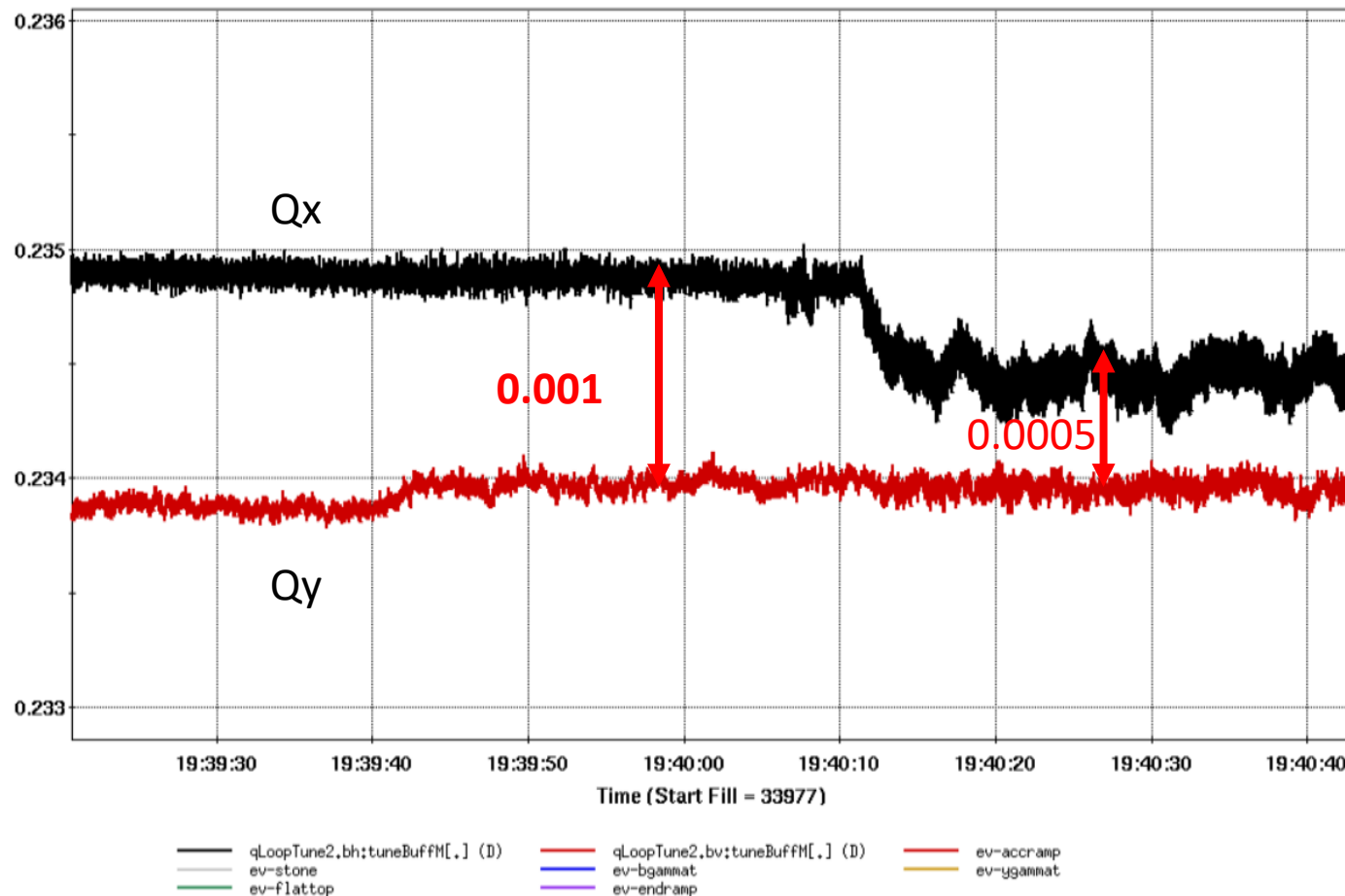
Maximize Emittance Ratio in RHIC for EIC

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General Remarks

- 1) We yielded about 1.75 hours for the early experiment: RHIC snake physics aperture optimization.
- 2) Mode switch from proton to Au and Au injection setup took about 2 hours.
- 3) We had to scrape off a planned 12*12 bunch ramp and directly went to a 28*28 bunch ramp. Made to store about 7pm.
- 4) Quickly checked coupling at store for the Blue ring then moved to generate 10:1 emittance ratio for studies (to measure ratio as function of tune split and coupling, to measure vertical growth rate with vertical cooling off). Unfortunately, we lost beams due to YI6-Q89-PS trip-off at 9:45pm.
- 5) Back to physics : 10-11pm as originally scheduled.

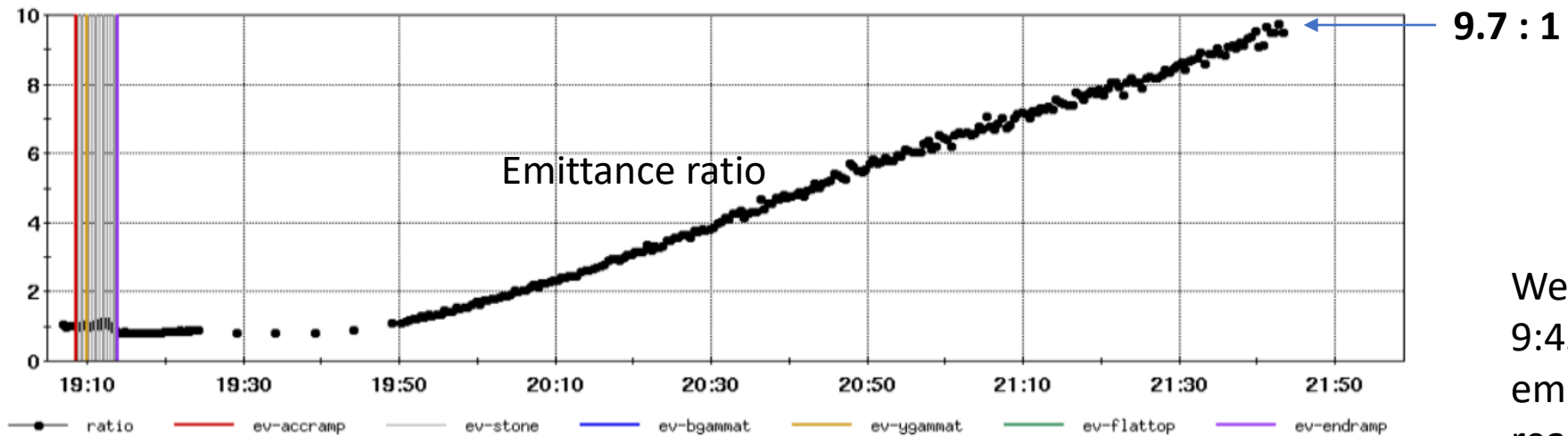
Measurement of Minimum Tune Split



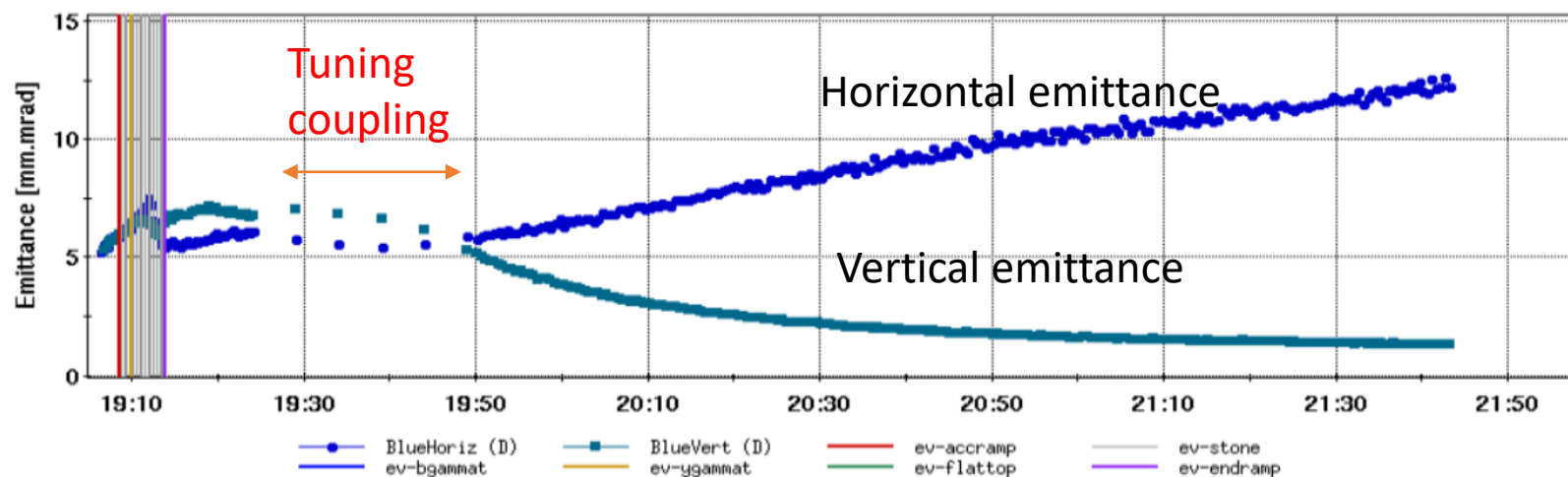
- We obtained $dQ_{\min} \sim 5e-4$ after some manual decoupling with coupling monitor.
- We noticed coupling changed when the tunes and orbit changed. To overcome this, we had to frequently trigger store orbit correction.
- Previously, we demonstrated $dQ_{\min}=3e-4$ at Au injection 7.3GeV.

Fill Number: 33977

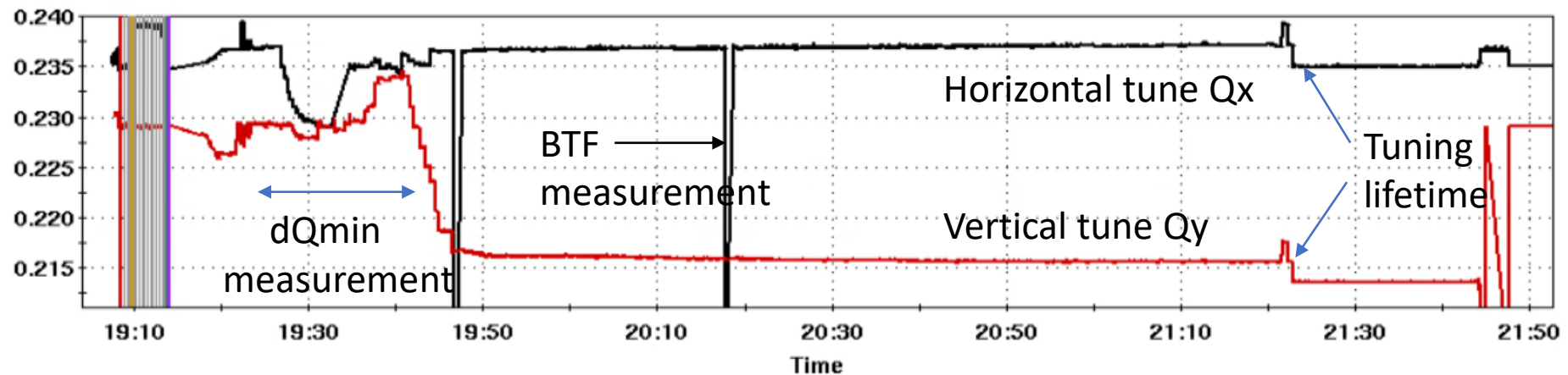
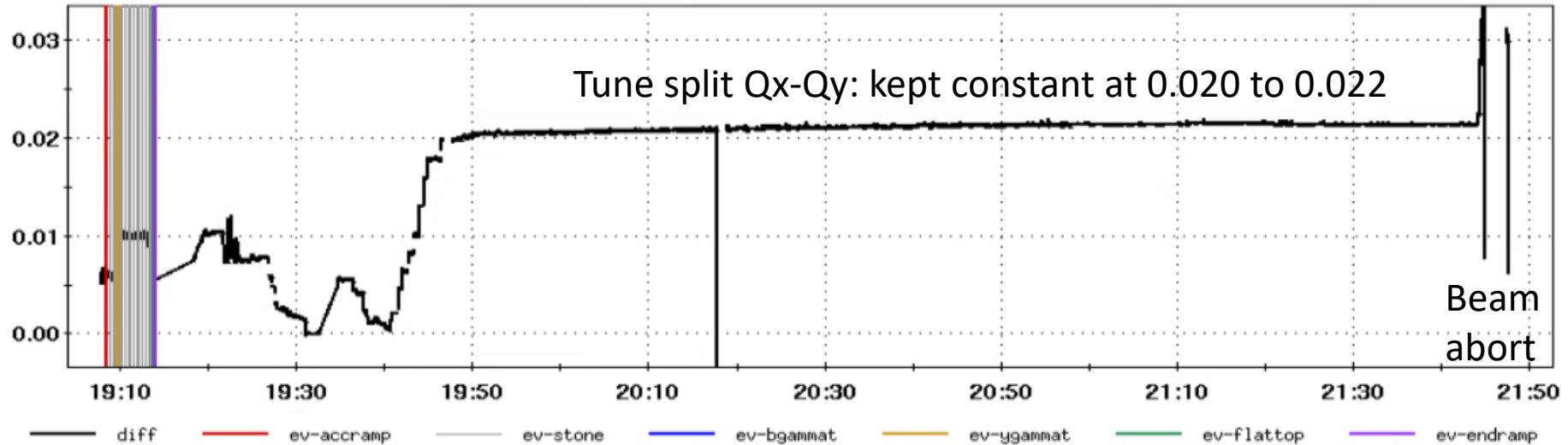
Generate Large Emittance Ratio



We lost beams at 9:45pm, when the emittance ration reached 9.7:1. Beam loss was due to yi6-q89-ps trip-off.



Tune Split at Store



Summary

- 1) We were short of beam time and unfortunately beams got lost at store by a PS trip-off.
- 2) We obtained a minimum tune split $5e-4$, which was better than ~ 0.002 we had in past two sessions. Minimum tune split was sensitive to orbit drift and tune changes.
- 3) Before beam abort, we had an emittance ratio 9.7:1 in the Blue ring.
- 4) **For next time: we will ask for 5 hours for one 28*28 bunch store**
 - 3 hours to get 10:1 emittance ratio
 - 1 hour for ratio dependence study and IBS rate measurement
 - 1 hour for contingency.