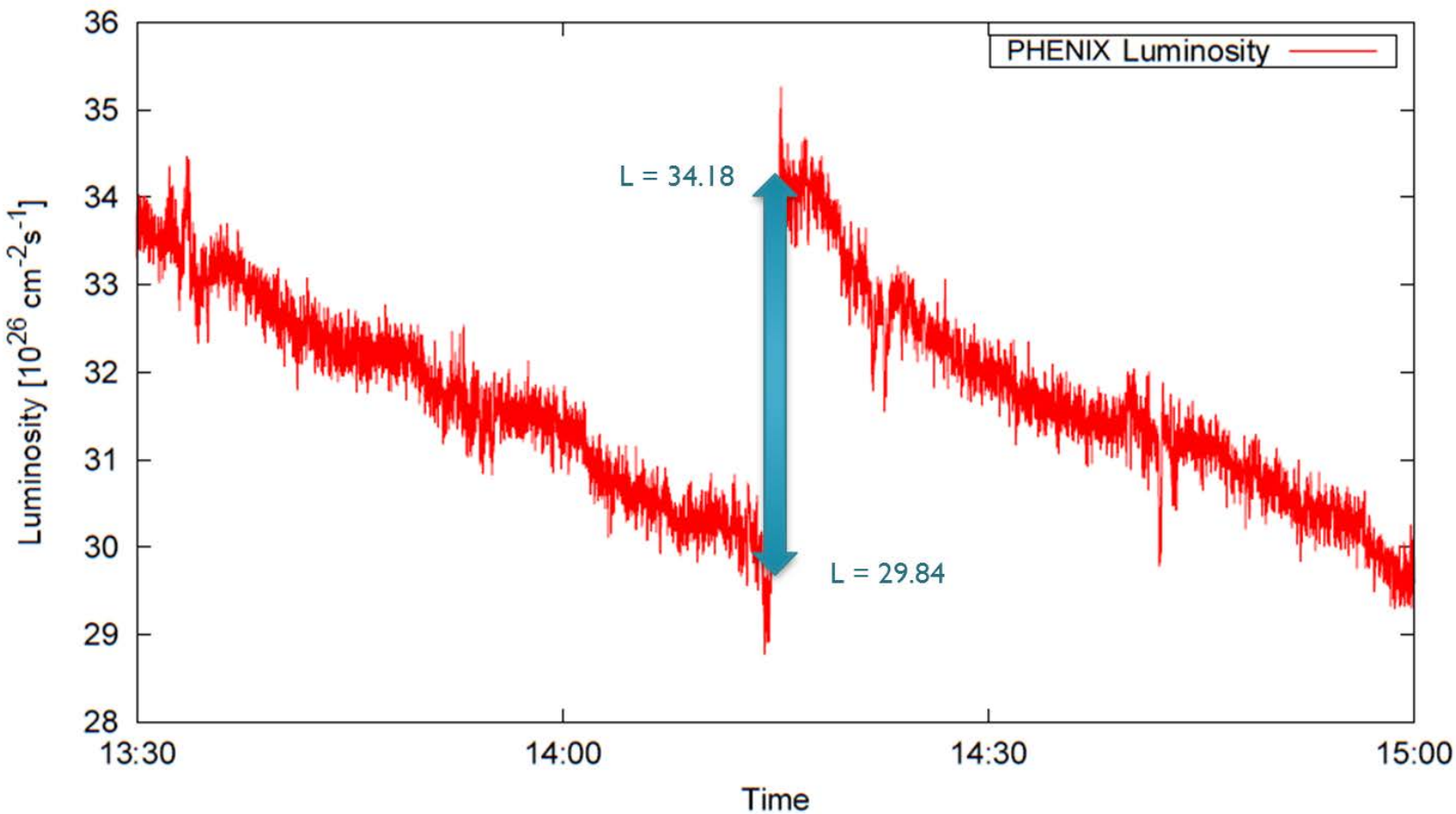
RHIC Run16 Dynamic β* Squeeze proposal

G. Robert-Demolaize (for THOR team)

What we learned from Run14



- Measured luminosity (ZDC) gain: Δ = 14.54%
- Predicted: $(\text{hourglass}/\beta)_{ATS}/(\text{hourglass}/\beta)_{classic}$ = 14.47% (using APEX optics measurements and assuming stable bunch length).

What we learned from Run14

- Timeline: from RHIC2014 Retreat
  - first APEX attempt: Fill #18126
    - established the storage ramp for telescope beta squeezing to 0.6m beta*
    - 1st time 100% online β-beat correction with loptics
  - first time reaching 50cm in Blue for Fill #18128
  - first time with 50cm in Yellow for Fill #18239

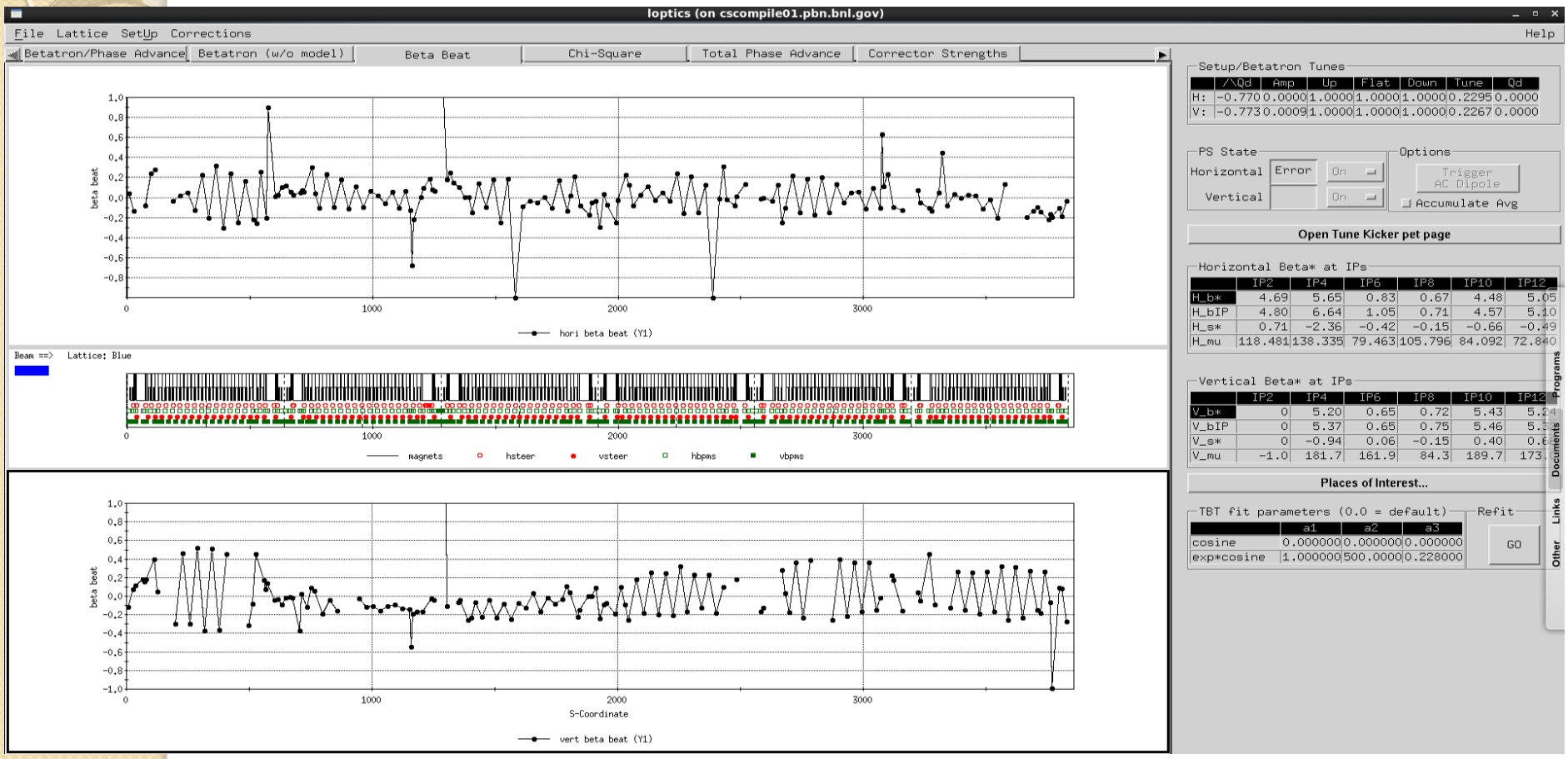
- End-of-store experiment:
  - with a 12x12 test ramp (APEX) = Fill #18272
  - with a full 111x111 = failed (LISA used Au14-s0 to re-optimize), Fill #18261
  - with a full 111x111 = successful, Fill #18320 (both Blue and Yellow)

- **THOR declared operational at Fill 18413 (6/12/2014)**

- Complications during commissioning:
  - need to commission each individual stone separately: APEX was the ideal place to do so;
  - chromaticity control: prefire protection bumps and their large orbit offsets in the corresponding arcs pushed our knobs to a whole different realm (about -60 units in Yellow…) => should be less of a problem with the new masks!

Plans for Run16

- <u>Timeline</u>: use APEX time (~2 hours) to implement corrections to linear optics.



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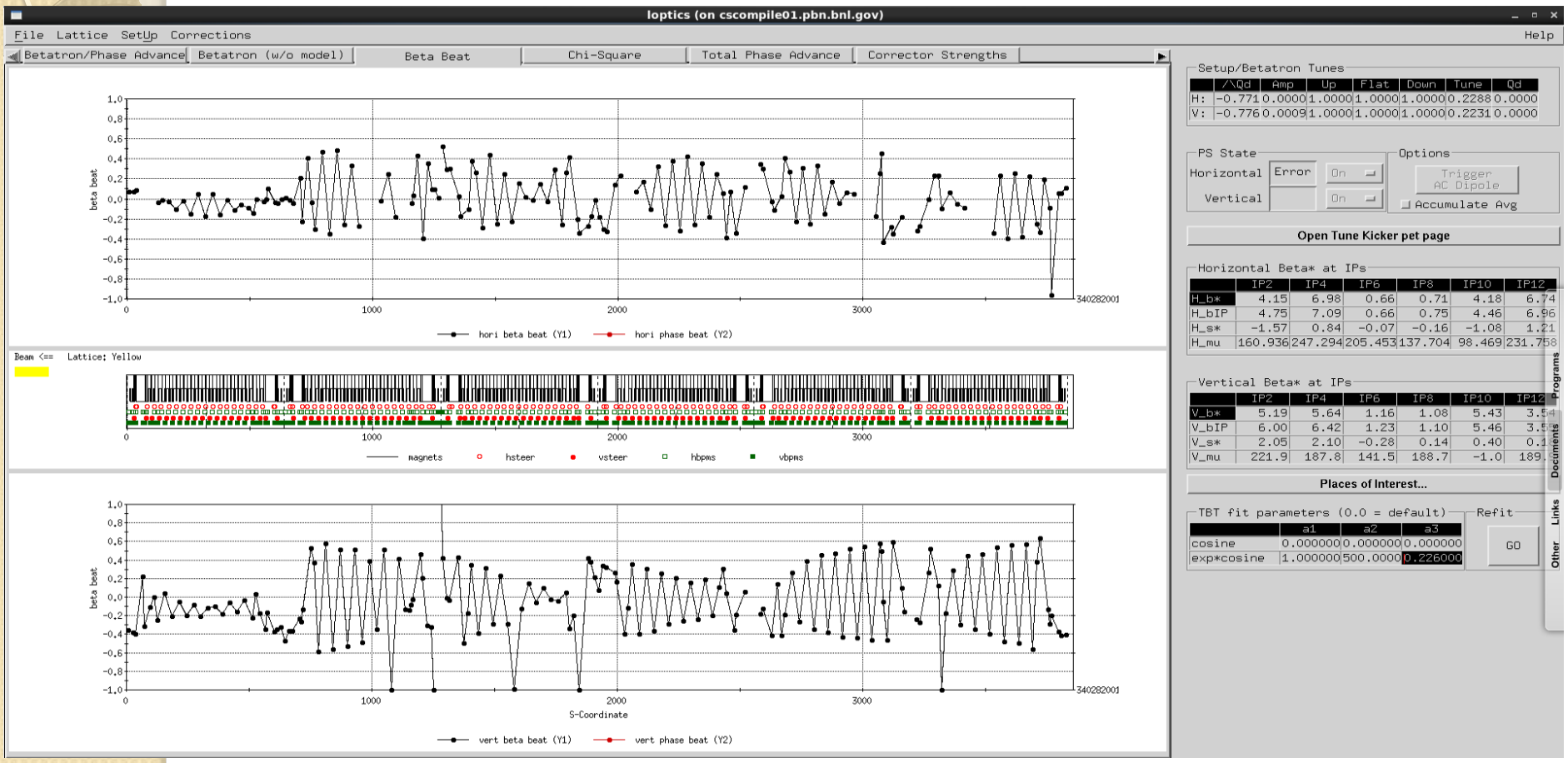

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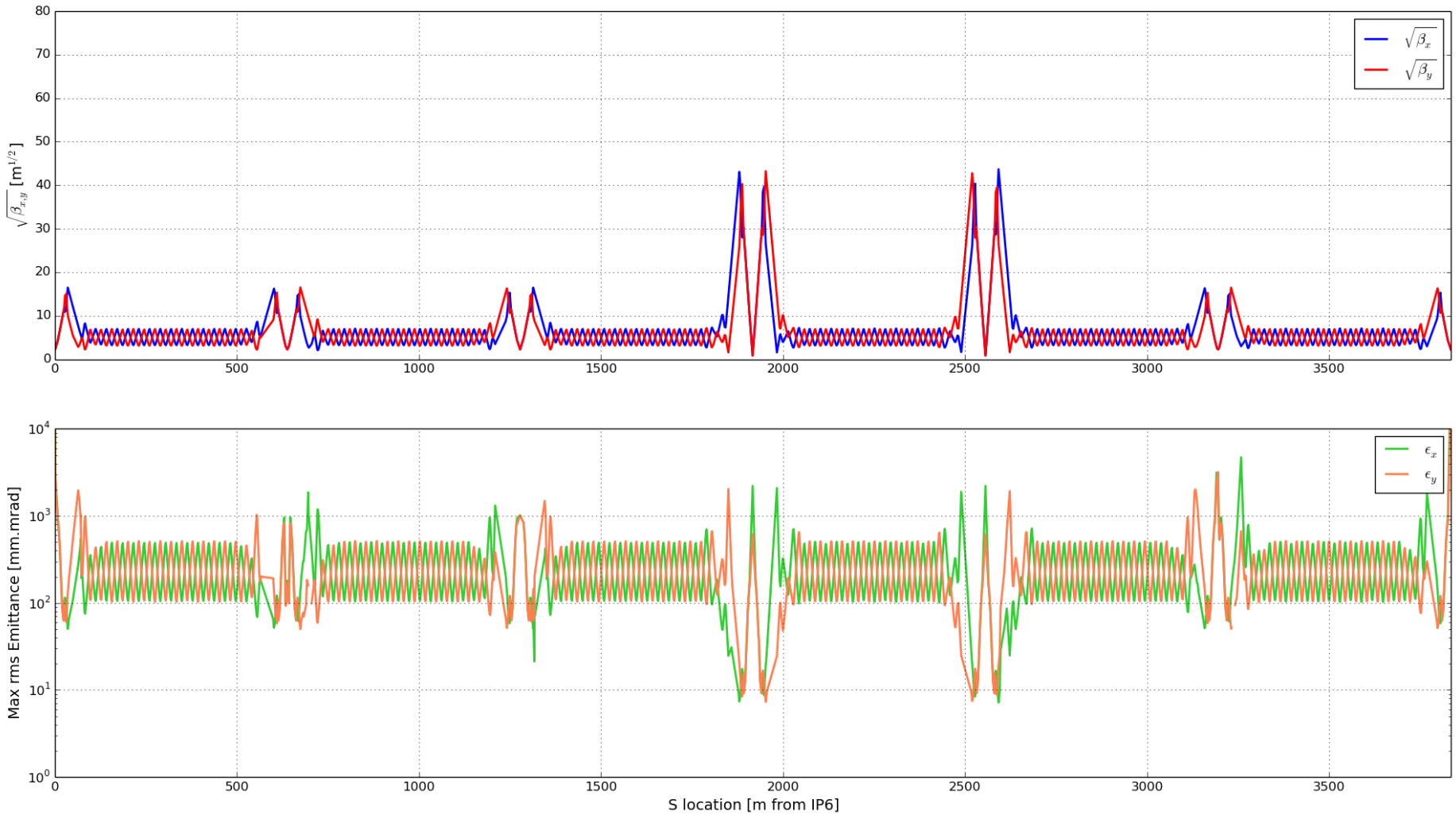
- <u>Timeline</u>: use APEX time (~2 hours) to implement corrections to linear optics.
- Use MD time (~4-6 hours) to set up Au16-thor:



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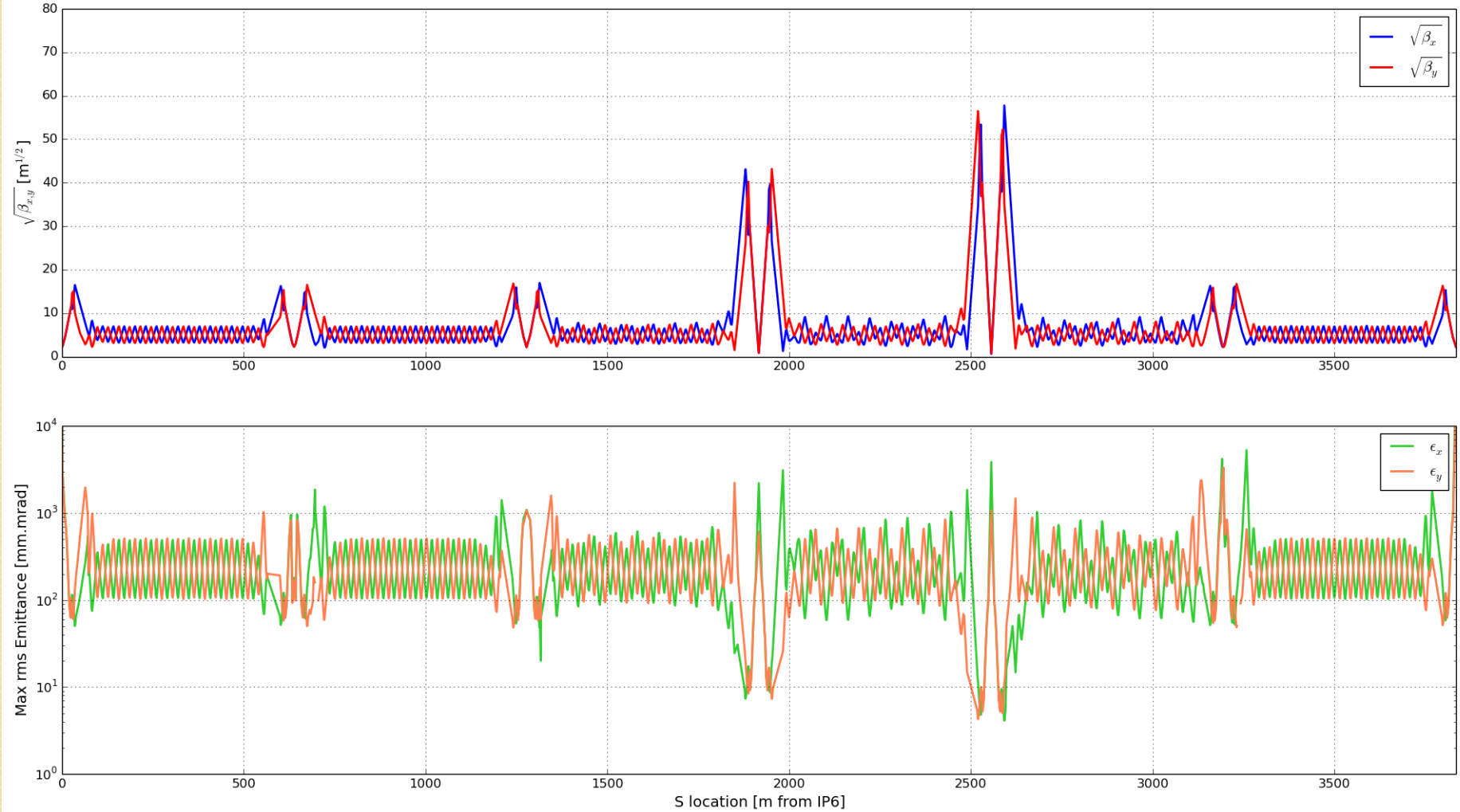

Open questions

- Lowest β^* to reach?
- When do we ramp to the squeezed settings?
- Remove pre-fire protection bumps?