MD 3287 Results
Luminosity scans with waist shifts

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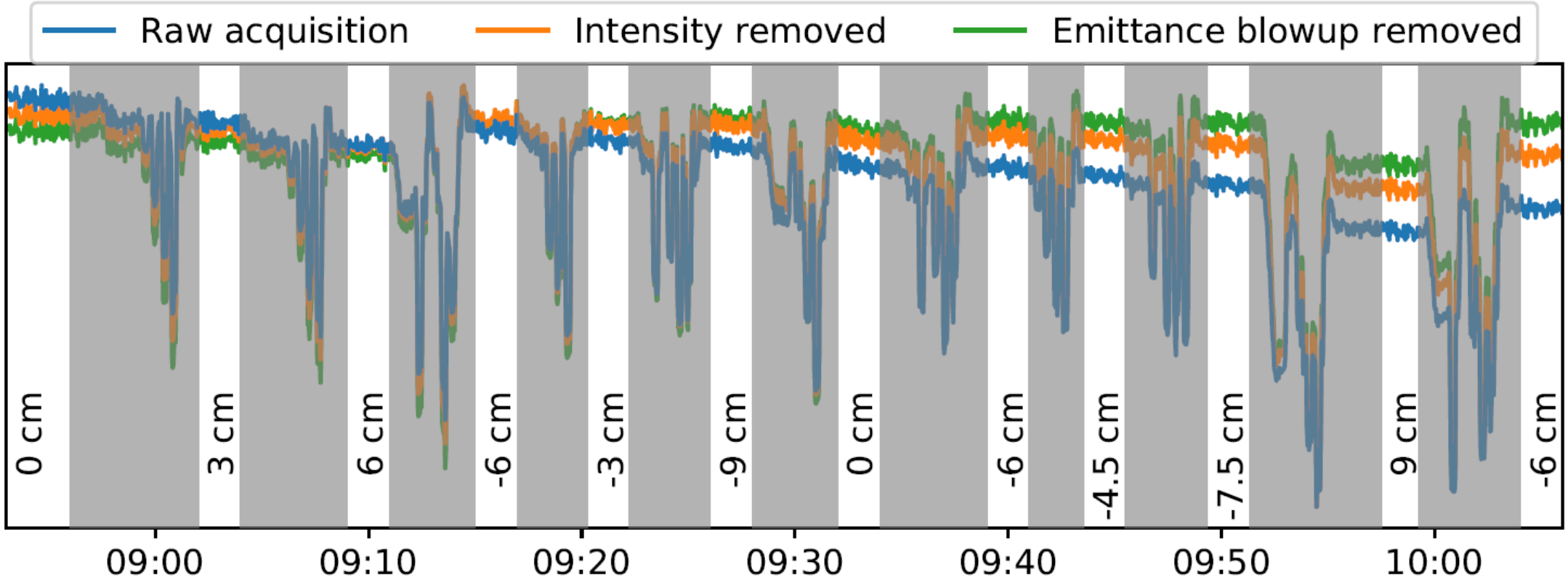
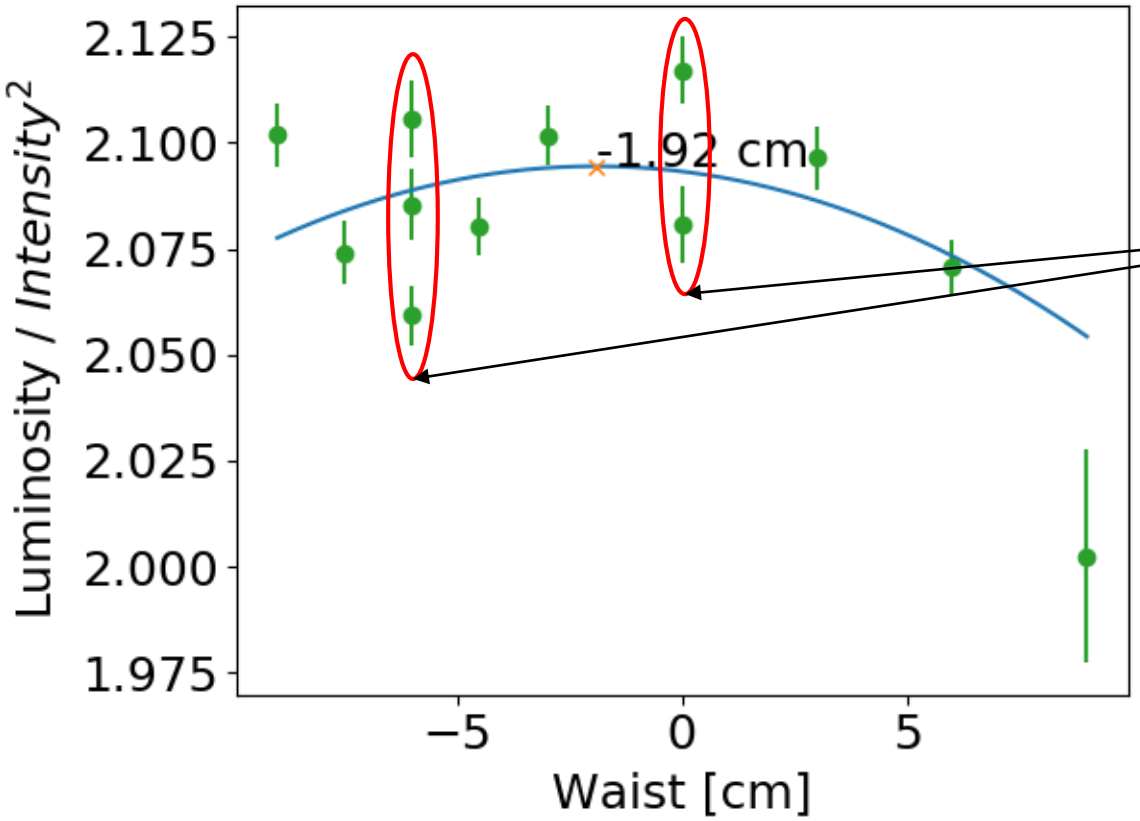
- This MD was performed the 16/09/2018 from 10:50 to 13:40
- Fill 7188
- Two waist knobs were prepared: Beam 1 and 2 vertical plane. Two scans of each knob where performed.
- The knobs strongly affected the tunes. This passed unnoticed until the second scan of each knob and probably impacted the emittance.

- First scan of Beam 1 vertical
- Normalizing to the beam intensity
- And fitting a line through the 0 points and subtracting from the luminosity signal, to remove the emittance blow-up decay.



- First scan of Beam 1 vertical
- After removing the intensity decay the scan looked nothing like a parabola:

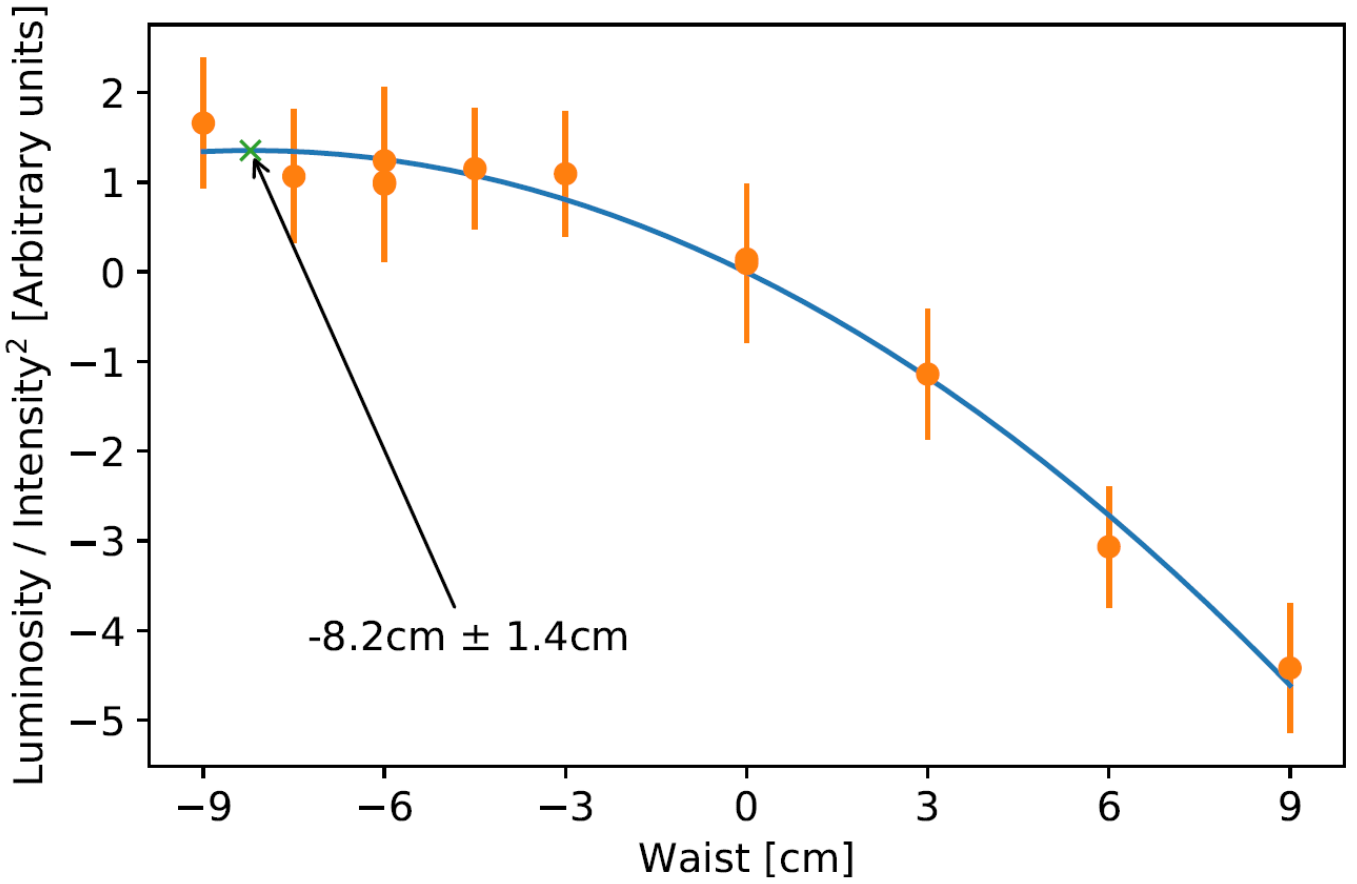


This should be a single point

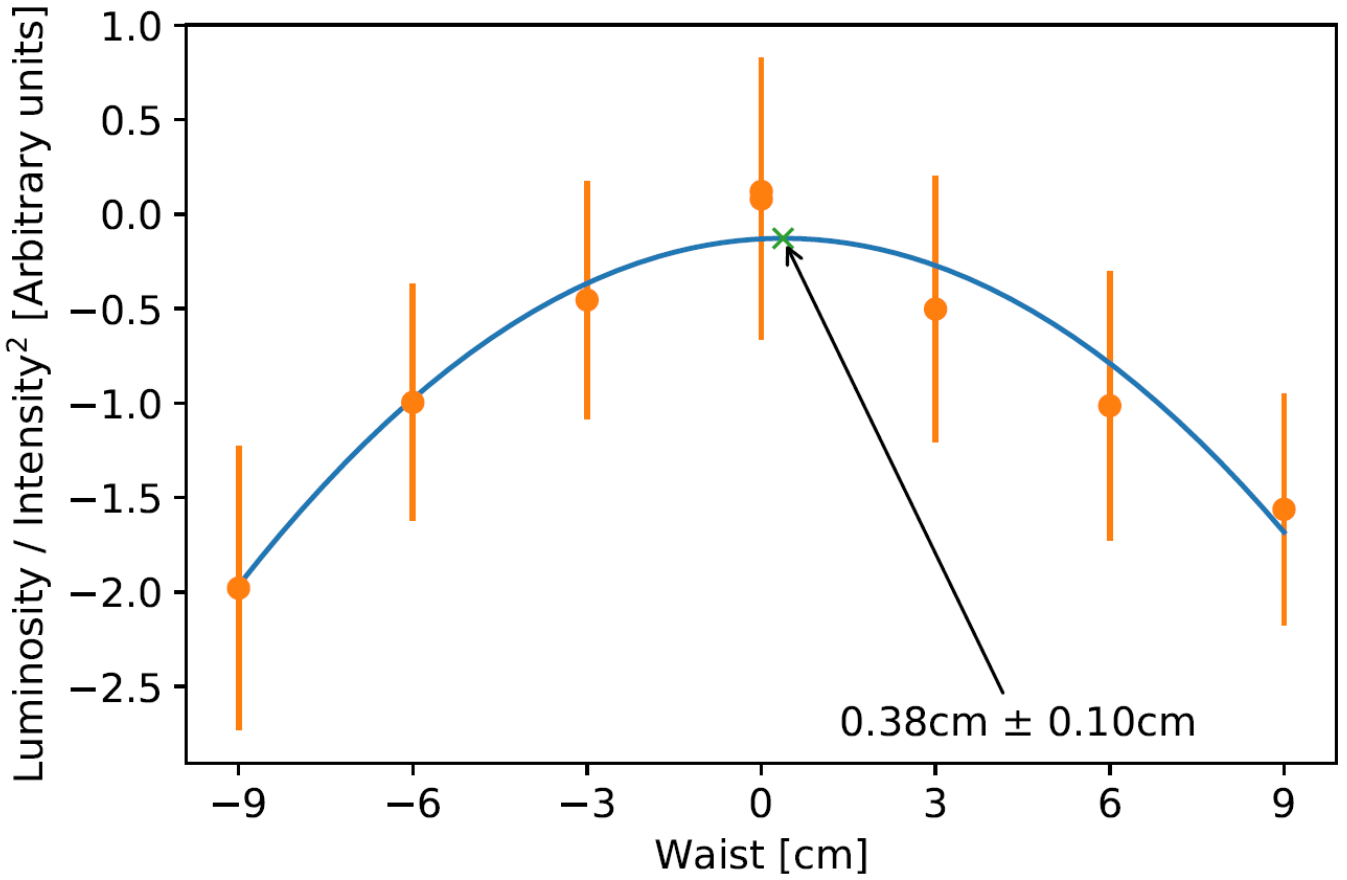
There is an additional decay in luminosity due to emittance blow-up

- First scan of Beam 1 vertical

- The parabola reaches its maximum at -8.2cm±1.4cm. Latest K-modulation measured a -8.1cm waist shift.



- Second scan of Beam 2 vertical
- The parabola reaches its maximum at 0.38cm±0.10cm. Latest K-modulation measured a 0.7cm waist shift.
- Performed with tune correction between steps.



- The method has been well validated and new sources of influence discovered:
  - Good agreement with K-modulation, at least in the latest measurements.
  - The influence of the tune deviation must be closely studied
  - We learned that we should take care in designing the knobs to keep the tune stable if possible.
- In combination with DOROS BPMs we envision a full alternative to K-modulation.