First look at local corrections in 2022

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Quick review of flat-top conditions

Optics measurements at FT were performed on Monday evening.

- Only on momentum kicks were obtained before RB dump
- No k-modulation measurements

Betas at IPs: IP1 = 1.33 m

                       IP2 = 10 m

                       IP5 = 1.33 m

                       IP8 = 2.0 m

Local errors in IP1 (1.33 m)

Beam 1

Beam 2

Hor.
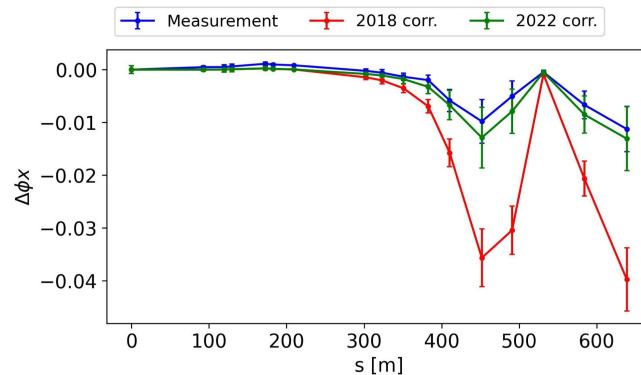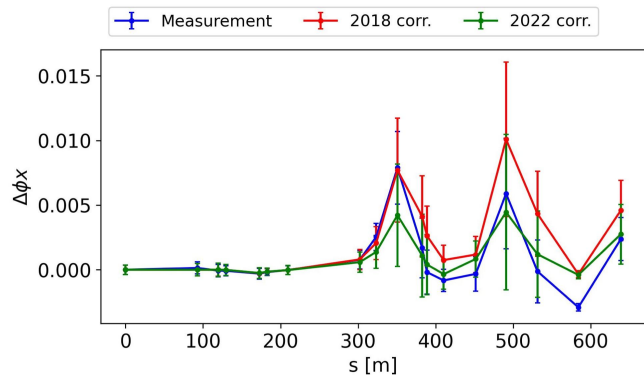
Ver.
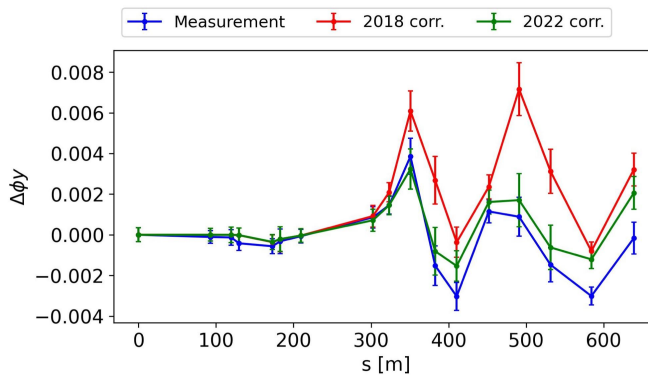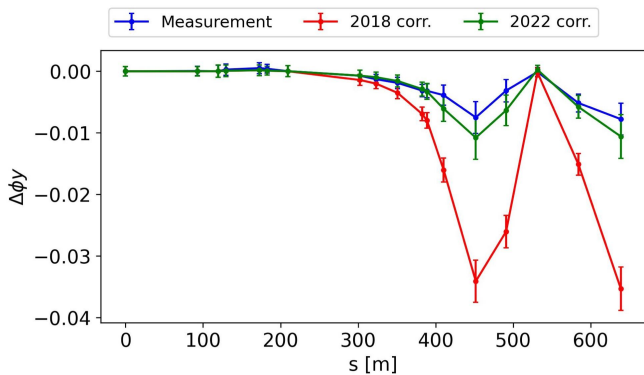
Local errors in IP5 (1.33 m)

Beam 1

Beam 2

Hor.

Ver.

CORRECTOR STRENGTHS

2018

ktqx1.l5 = - 2.0E-5
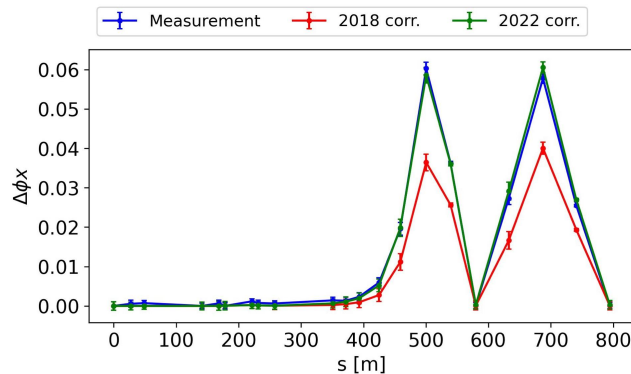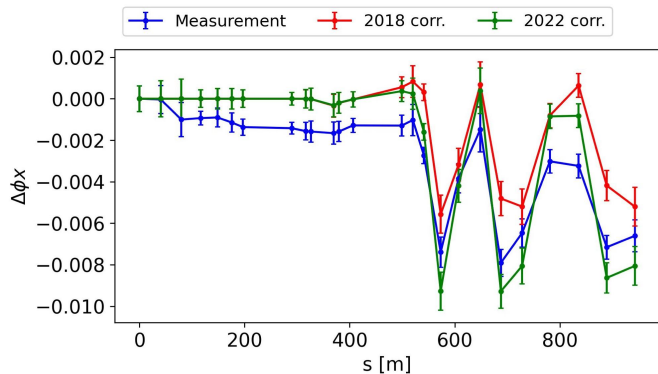ktqx1.r5 = + 2.0E-5
ktqx2.l5 = + 2.6E-6
ktqx2.r5 = + 1.58E-5
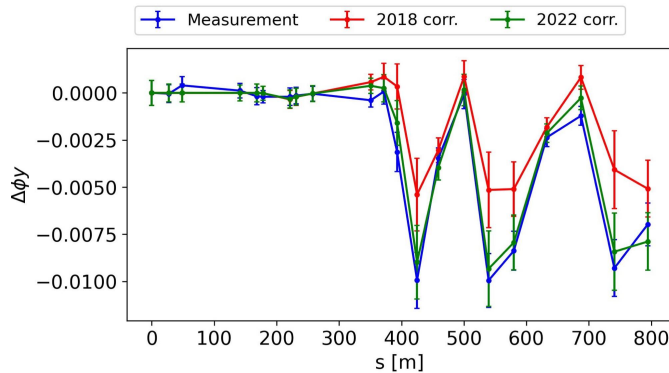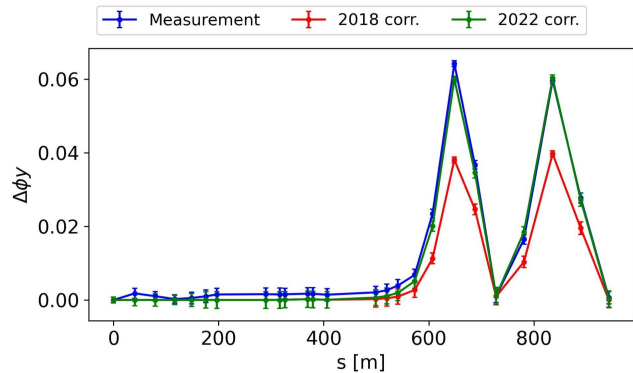
MQXA.3L5->K1 = - 1.49E-5
MQXA.3R5->K1 = + 1.49E-5

2022

ktqx1.l5 = - 2.0E-5
ktqx1.r5 = + 2.0E-5
ktqx2.l5 = + 1.9E-6
ktqx2.r5 = + 2.2E-5

MQXA.3L5->K1 = - 1.49E-5
MQXA.3R5->K1 = + 1.49E-5

4

Local errors in IP8 (2.0 m)

Beam 1

Beam 2

Hor.

Ver.

CORRECTOR STRENGTHS

2018

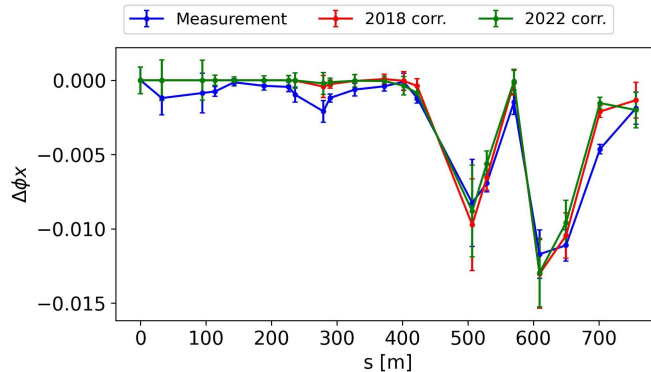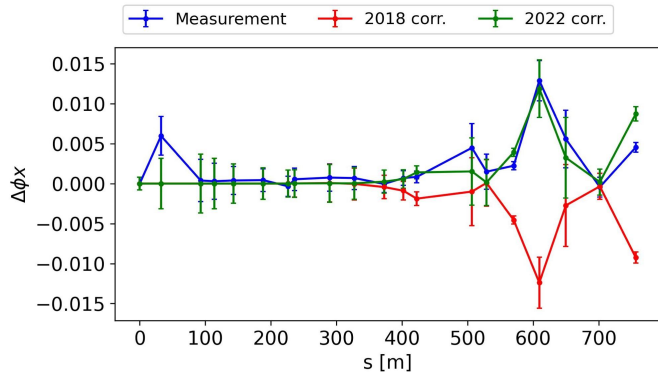ktqx2.l8 = -1.0E-5

2022

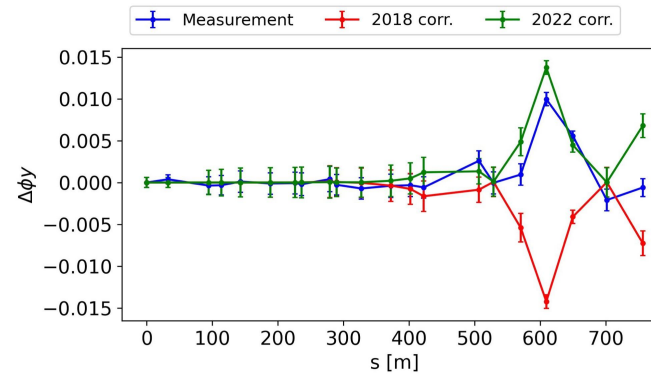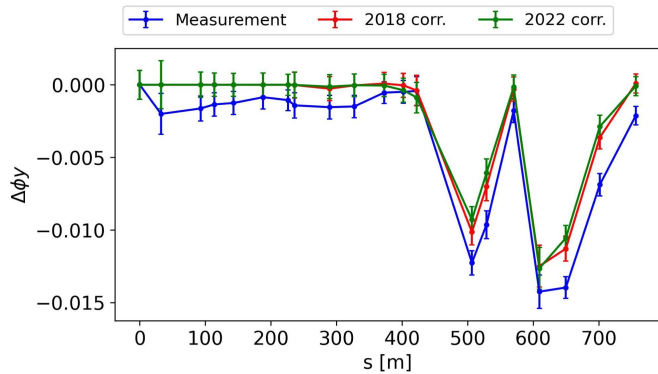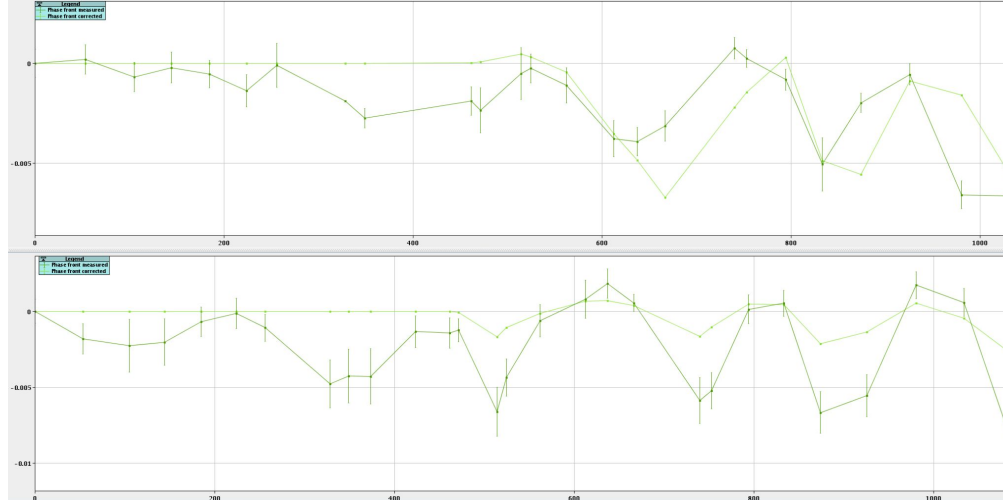ktqx2.l8 = -0.5E-5
ktqx2.r8 = -1.0E-5

Local errors in IP2 (10.0 m)

Data from IP2 segment-by-segment analysis is harder to analyse.

- Low phase deviation in sbs analysis below 0.005 dphi
- Suggests small errors
- Larger error-bars compared to phase deviation

Current data would suggest a lowering of correction strength for both MQXT2 left and right of IP2.

CORRECTOR STRENGTHS

2018

ktqx2.l2 = -1.5E-5
ktqx2.r2 = +1.5E-5

2022

ktqx2.l2 = -1.0E-5
ktqx2.r2 = +1.0E-5

Conclusions

Current measurements at 1.33 m optics suggest some changes to the local corrections in comparison with Run 2 corrections.

- No critical errors observed for now.

More detailed measurements at squeezed optics with k-modulation data will help fine tune local linear corrections

- Will provide larger phase errors to work with
- Possibility to match beta functions more accurately with k-modulation data

To be continued..