

LHC NL Commissioning

A quick peek at preliminary chromaticity and RDTs results

Maël Le Garrec & OMC
BE-ABP-LNO

Outline

Chromaticity Measurements

- Setting
- Observations
- Plots

Resonance Driving Terms

- Measurement

Conclusion

Setting

4 measurements were taken during the commissioning:

- 2022-04-23:
 - Confirming 2021's *beam test* data
- 2022-04-24:
 - Confirming previous day data
 - After Correcting Q''''
 - After Correcting Q''

Wide range of dpp:

- from -0.0032 to 0.0037

Observations

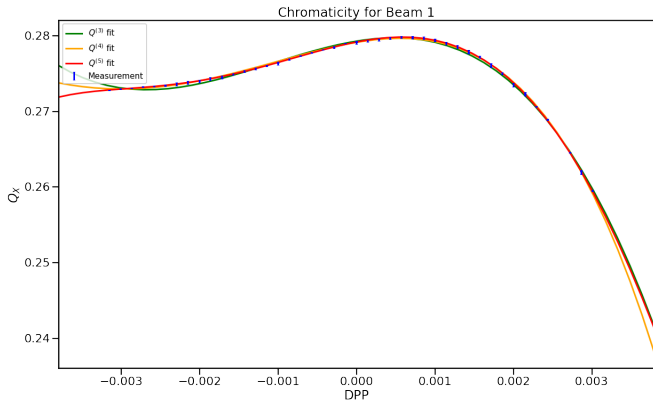
Overall good data for analysis.

- First measurement:
 - Q'' close to *beam test*
 - Q''' doesn't agree with *beam test*, but does with 2016
- Second Measurement:
 - Same result as above
- Third Measurement
 - Q''' well corrected
- Fourth Measurement
 - Q''' and Q'' corrected

Probable fourth and *fifth* (??) order chromaticity observed!

Before Correction

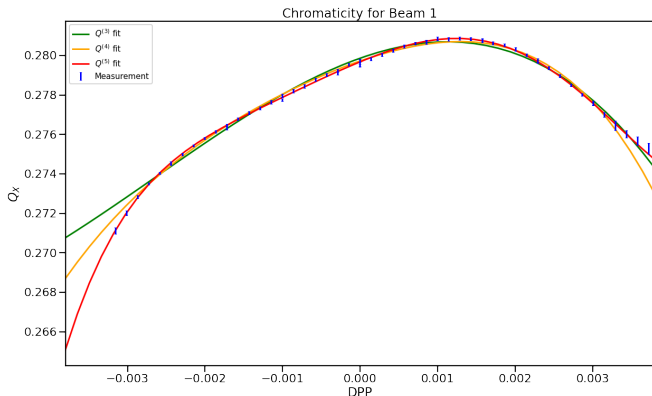
$$Q'' = -2.83 \cdot 10^3 \quad ; \quad Q''' = -2.59 \cdot 10^6$$



After Correction

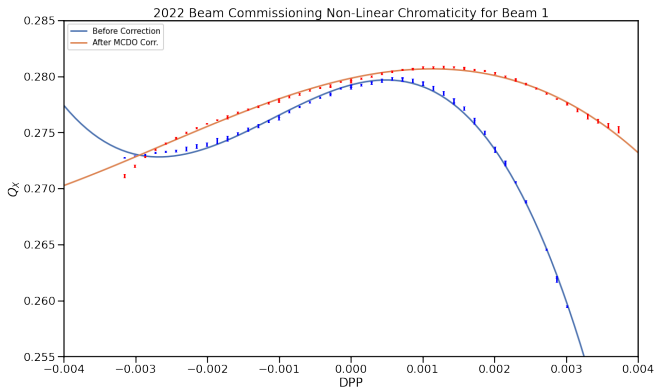
With uniform MCDOs corrections

$$Q'' = -1.0 \cdot 10^3 \quad ; \quad Q''' = -0.38 \cdot 10^6$$



Comparison

Taking $Q^{(4)}$ and $Q^{(5)}$ into account would raise Q''' estimate



Outline

Chromaticity Measurements

Setting

Observations

Plots

Resonance Driving Terms

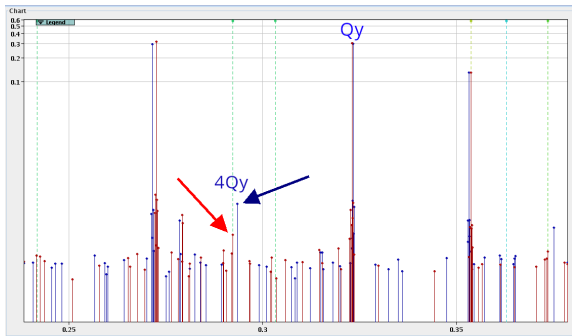
Measurement

Conclusion

Measurement

Kicks via AC-Dipole close to the tune

- b5 resonance observed!
- Seems to get worse after Q''' corrections
 - Would indicate a non-global source of b5



→ Before Q''' correction ; → After Q''' correction

Outline

Chromaticity Measurements

Setting

Observations

Plots

Resonance Driving Terms

Measurement

Conclusion

Conclusion



- Exciting data
 - Further analysis required
- Super productive team thanks to OMC cake