Comparison of Dispersions
in IR1 and IR5 during 2011 and 2012

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on behalf of the OMC team

Overview

- Dispersion in IR1 (ATLAS) and IR5 (CMS)

- Configurations for 2011 and for 2012

- Comparison of model with measurements

- Raise question on future correction strategy

	2011[1]	2012[2]
Energy [TeV]	3.5	4
β^* [m]	1 / 10 / 1 / 3	0.6 / 3 / 0.6 / 3
Crossing	on	off
Separation	off	off
Spectrometers	on	on

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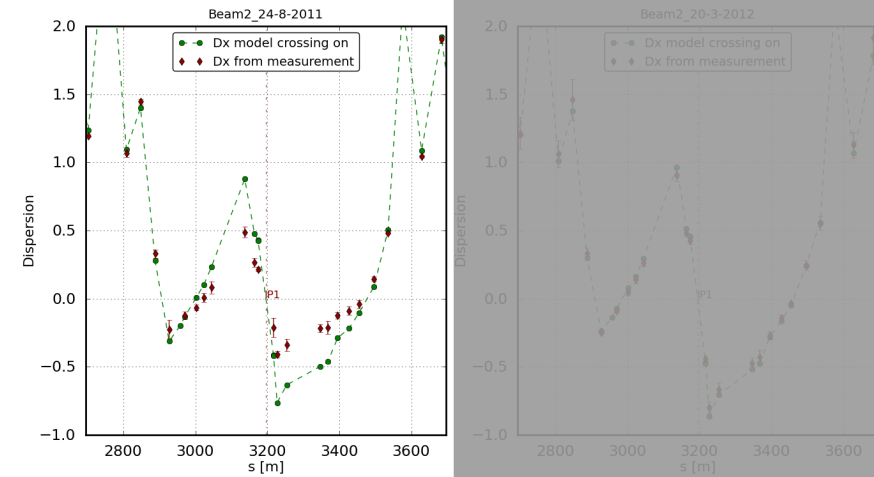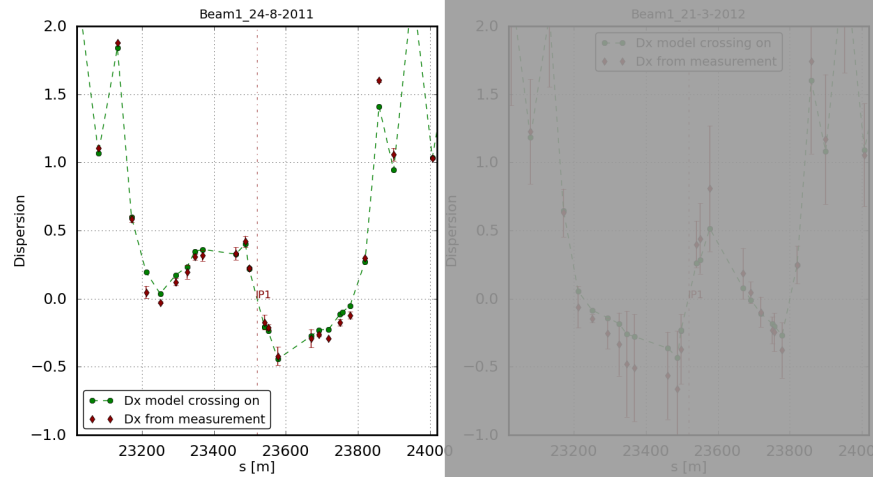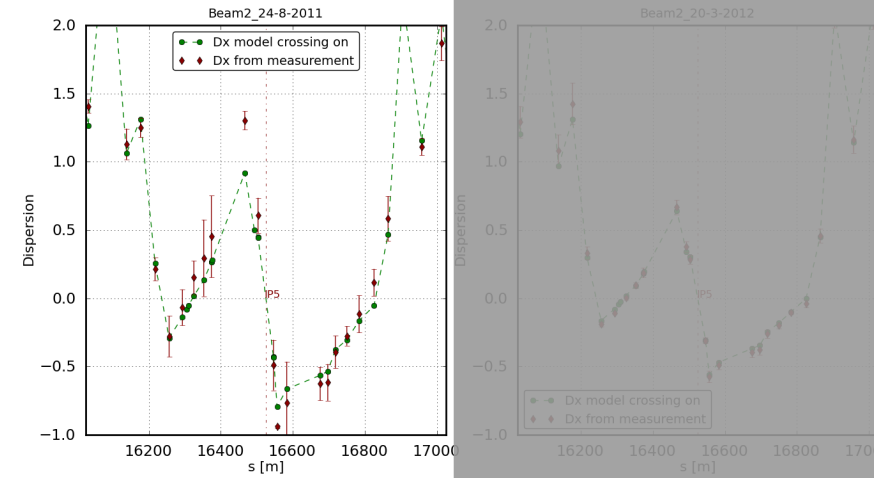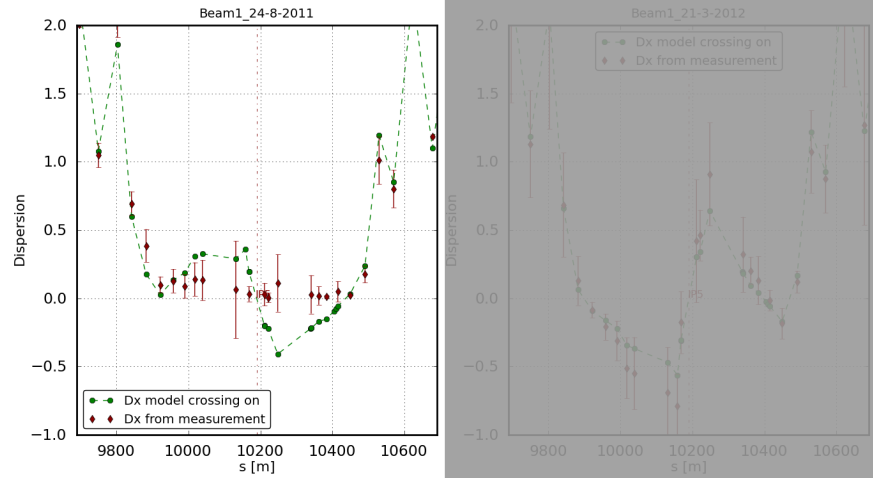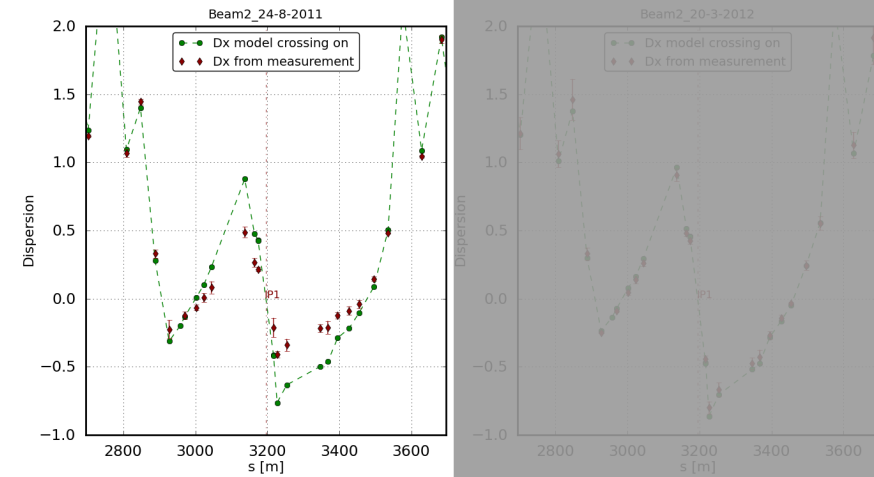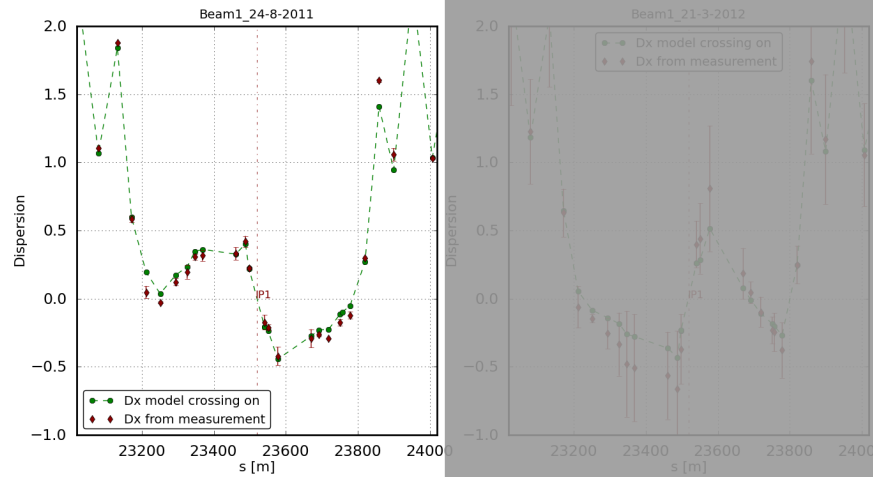|	2011[1]	2012[2]
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With crossing angles (ref. 2011)

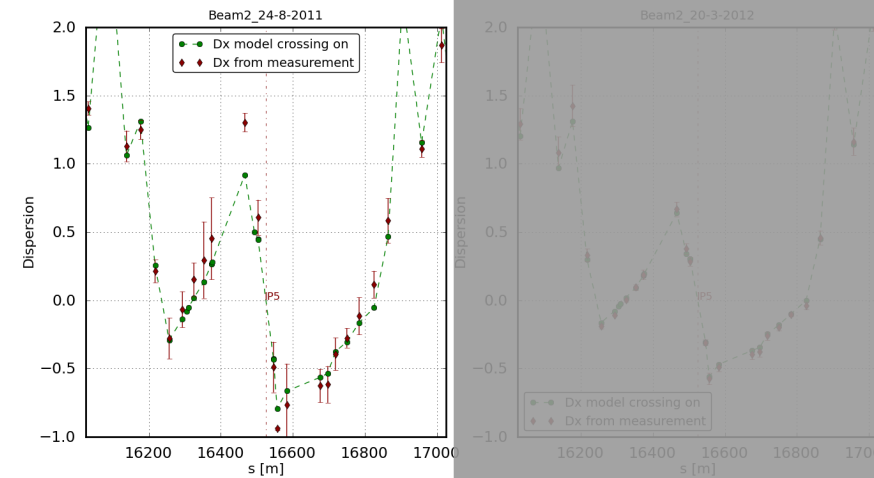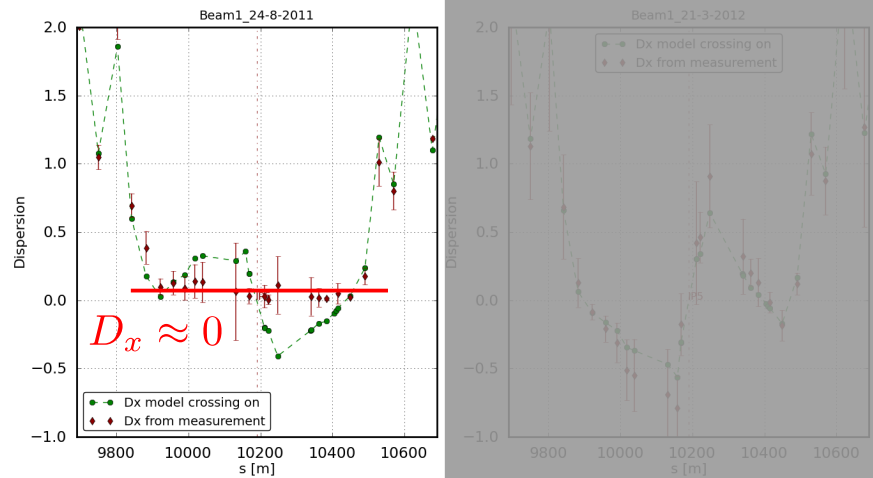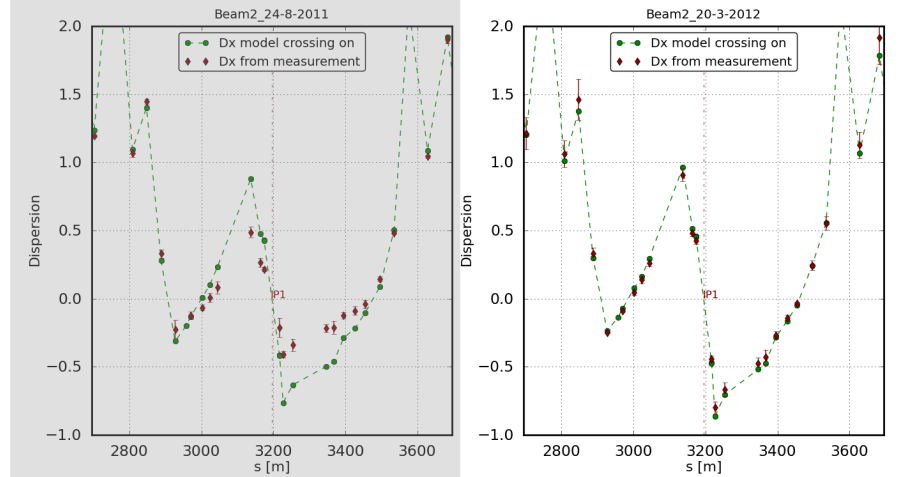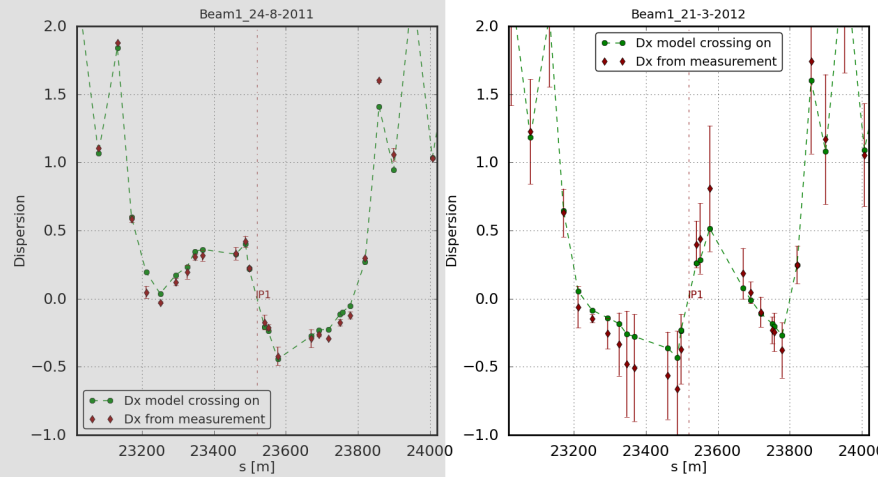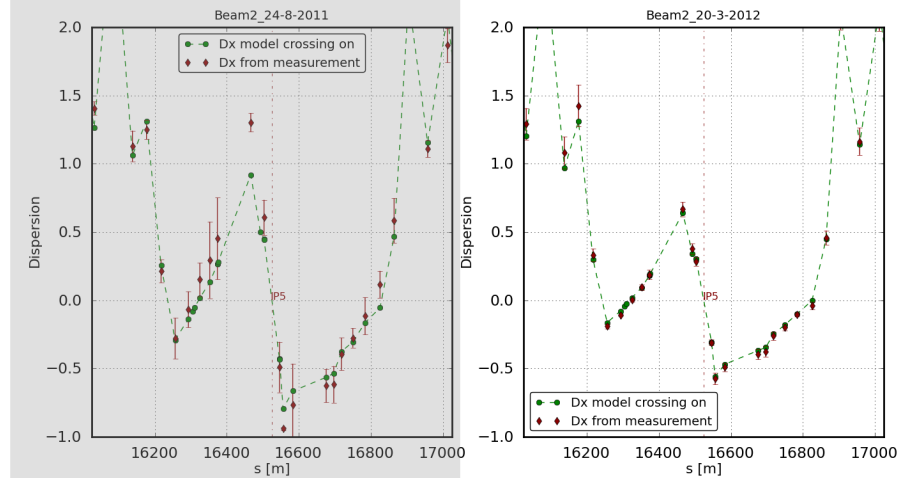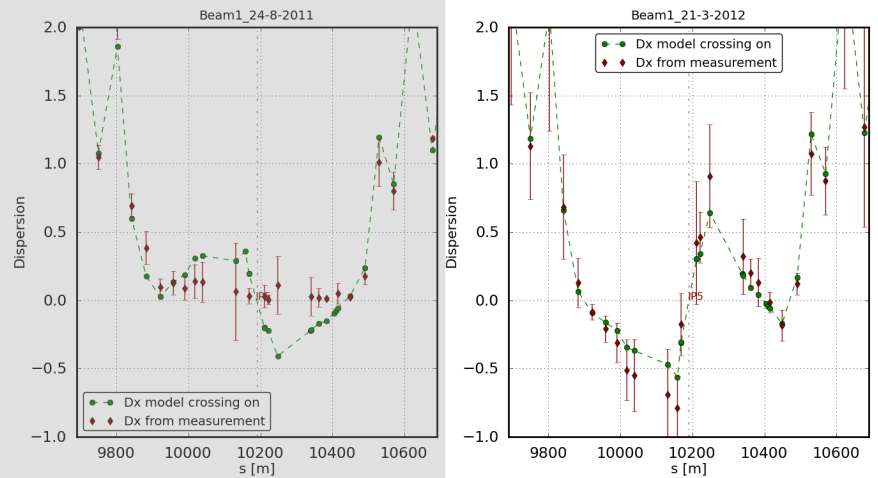Beam 1   Beam 2
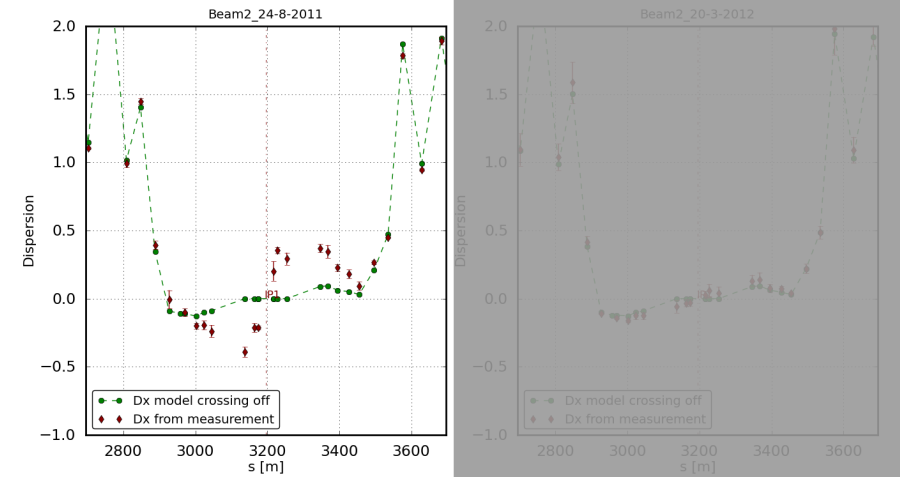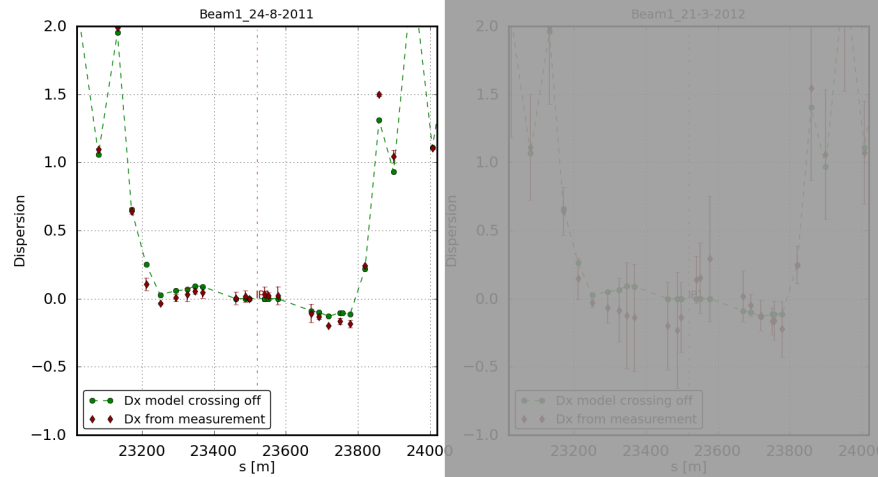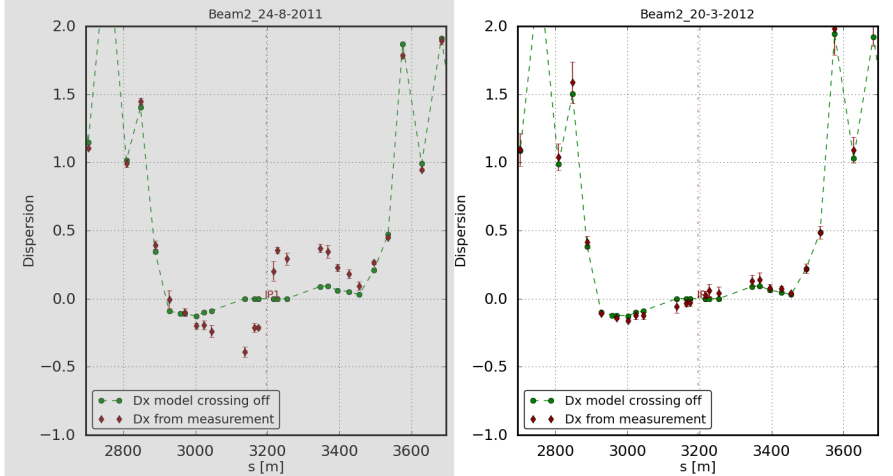

IR 1

IR 5

With crossing angles (ref. 2011)

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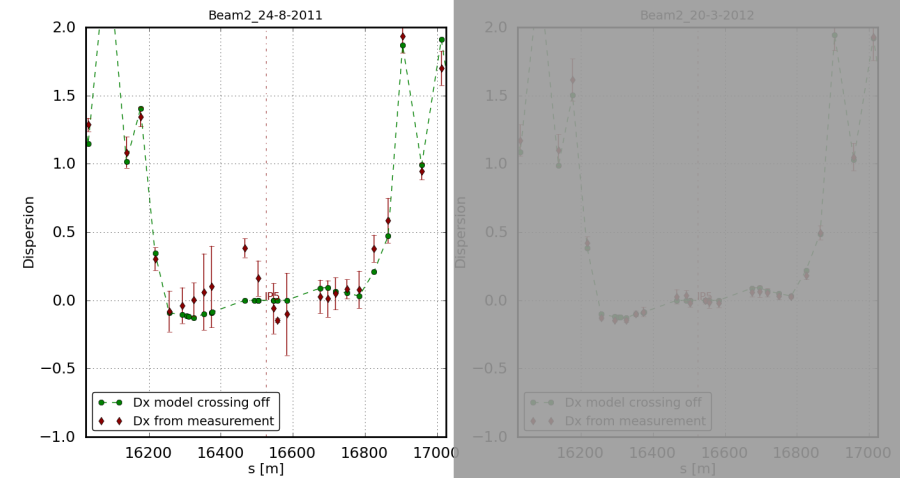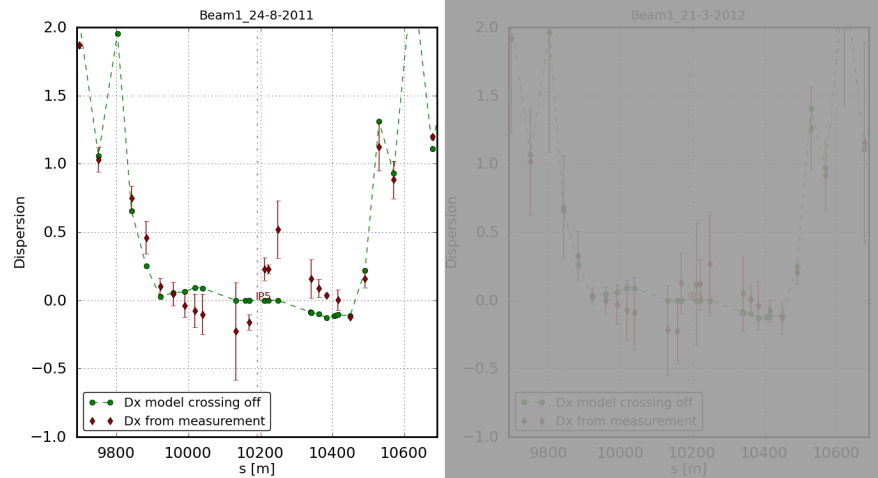
Crossing angles removed (ref. 2012)

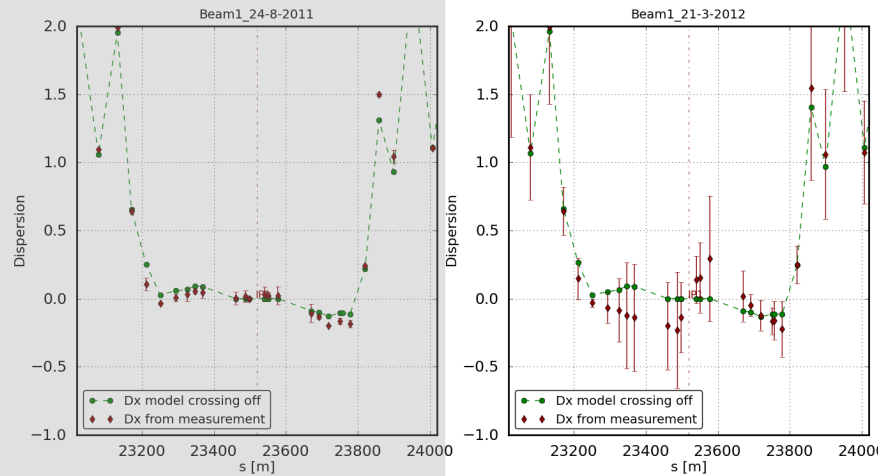# Crossing angles removed (ref. 2012)
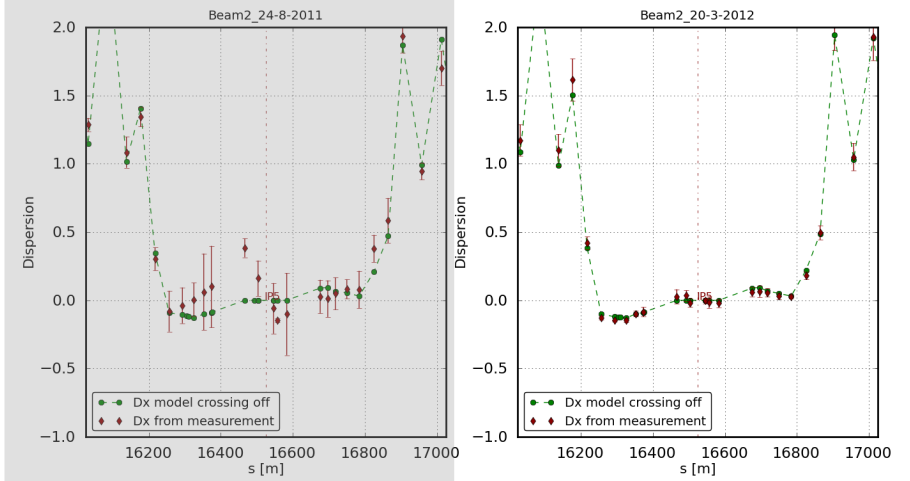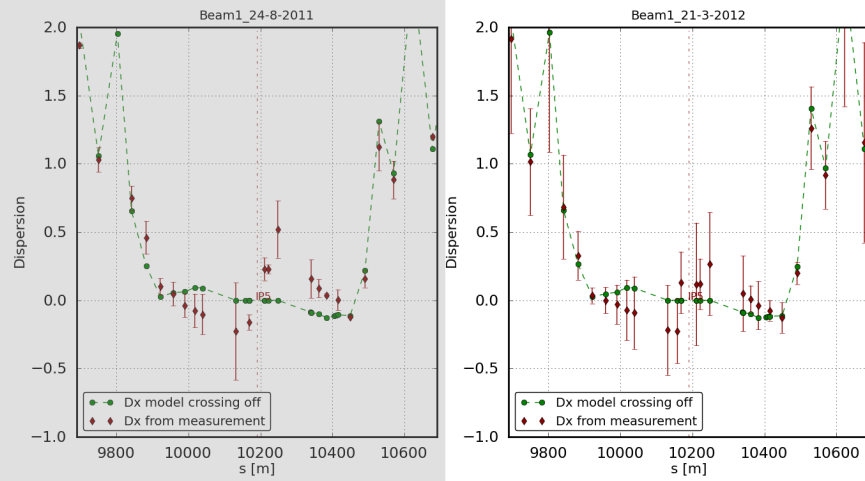
Conclusions

- Corrections for dispersion implemented in 2012 are evident

  - 2012 (without crossing):
    dispersion well matched to model

    - Beam 2 nearly perfectly matched in both IRs

    - Beam 1 slightly too high (about 0.3 m at local peaks) in both IRs

  - 2011 (with crossing):
    deviations of dispersion from model depending on beam and IR

    - Beam 1

      - IR1 nearly perfectly matched
      - IR5 close to zero dispersion

    - Beam 2

      - IR1 slightly too low (about -0.4 m at local peaks)
      - IR5 slightly too high (about 0.4 m at local peaks)

Outlook

- What is the impact of dispersion in the IRs on the beam quality/stability? Can we quantify this?

  - Simulate the impact of the dispersion on basic observables: physical aperture, DA, Q', Q'', D_2

    - Extend OMC software to measure D_2

- Correction strategy:

  - Should we correct towards the model (2012) or rather target for zero dispersion in the IRs (2011, Beam 1, IR5)?

  - What is the price to pay for the later?

  - Simulate the correction of spurious dispersion to evaluate feasibility/limits