Polarity checks, arcs 23 & 87/76/65

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Thanks to C. Alabau, S. Fartoukh and F. Schmidt

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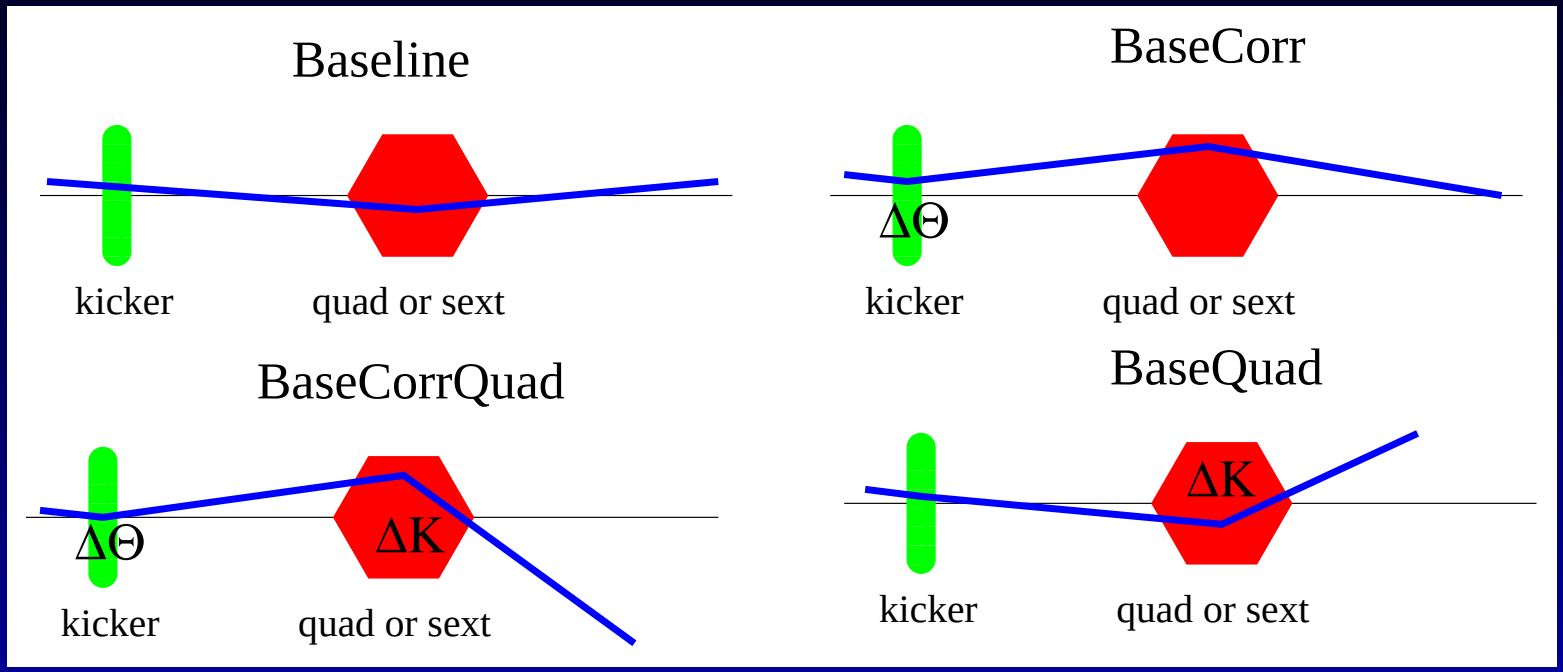
Procedure



Orbit = (BaseCorrQuad - BaseQuad) - (BaseCorr - Baseline)

Linear elements

- dp/p=0
- MAD enough but PTC with a_2, b_2 should help
- Model procedure:

Orbit = BaseCorrQuad - BaseCorr

(denoted by MAD* for non-linear elements)

Non-linear elements

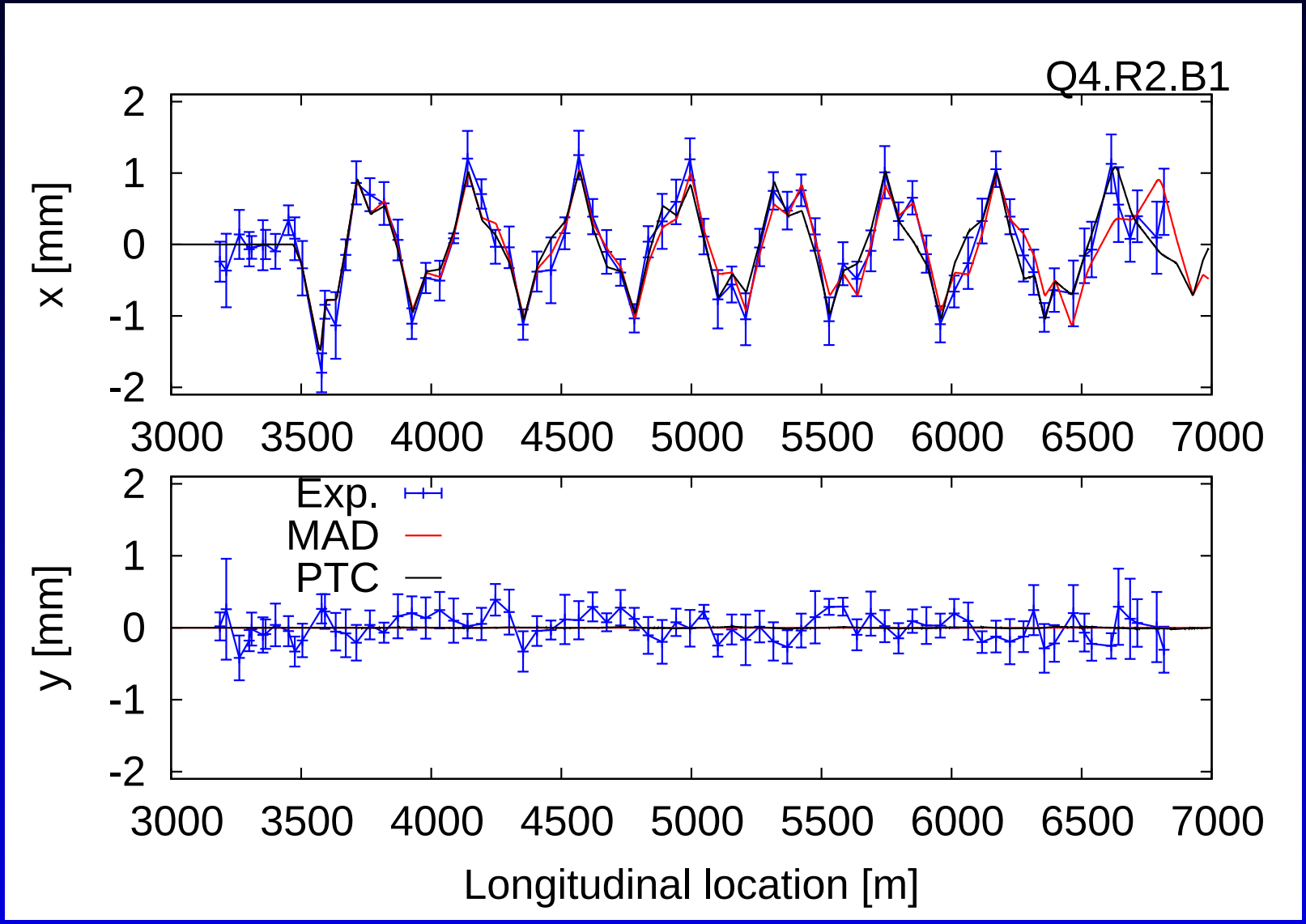
- dp/p≈-0.002
- PTC with a_2, b_2, a_3, b_3
- Model procedure: same as Exp.

(denoted by PTC)

Beam 1

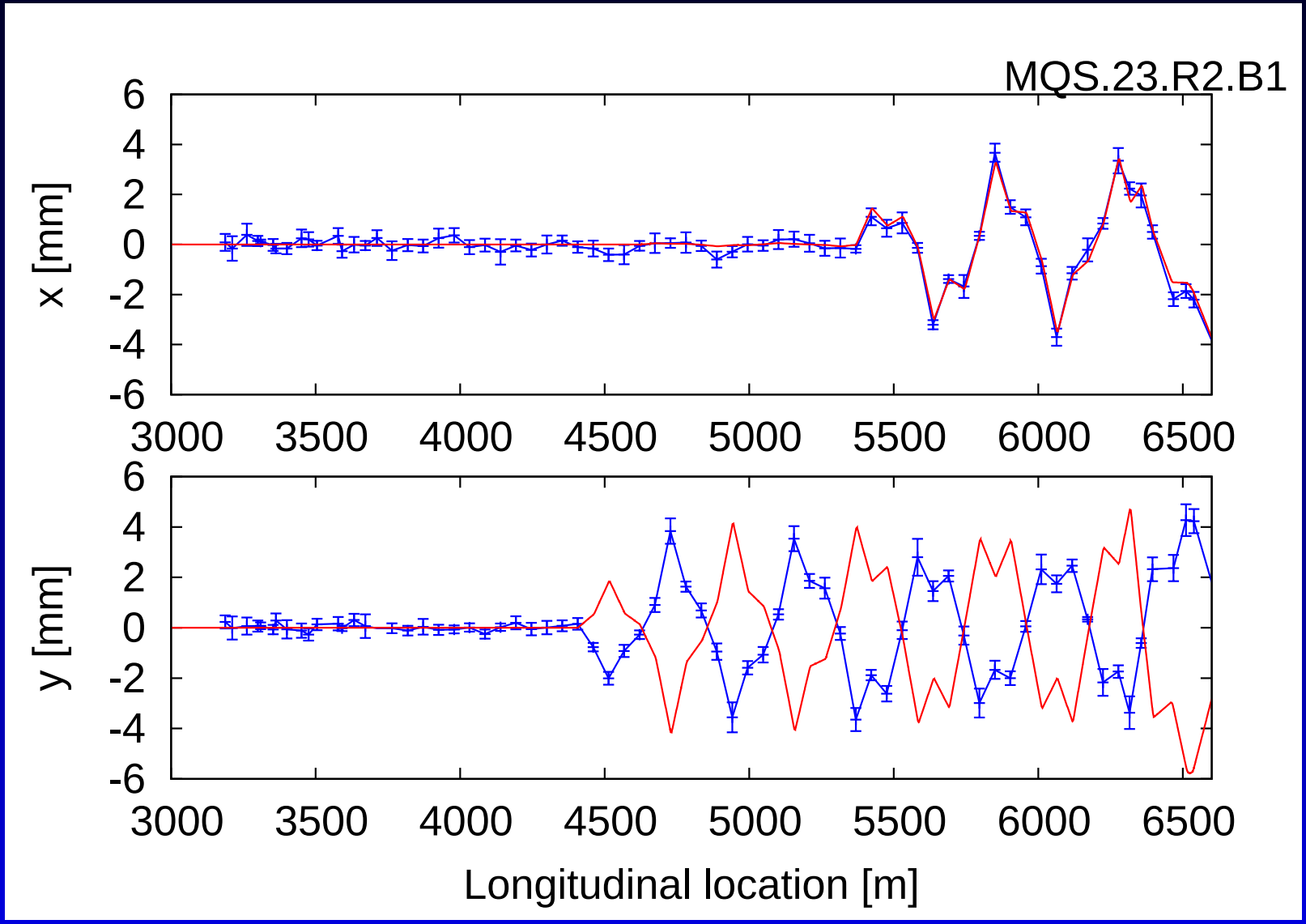
- Q4.R2.B1 (corrector: acbxh3.r2)
- MQS.23.R2.B1 (corrector: acbch6.r2b1)
- SD1.A23B1 (corrector: acbcv5.r2b1)
- MSS.23.R2.B1(corrector: acbcv5.r2b1)
- KOF.A23.B1 (corrector: acbch6.r2b1)

Q4.R2.B1 (corrector: acbxh3.r2)



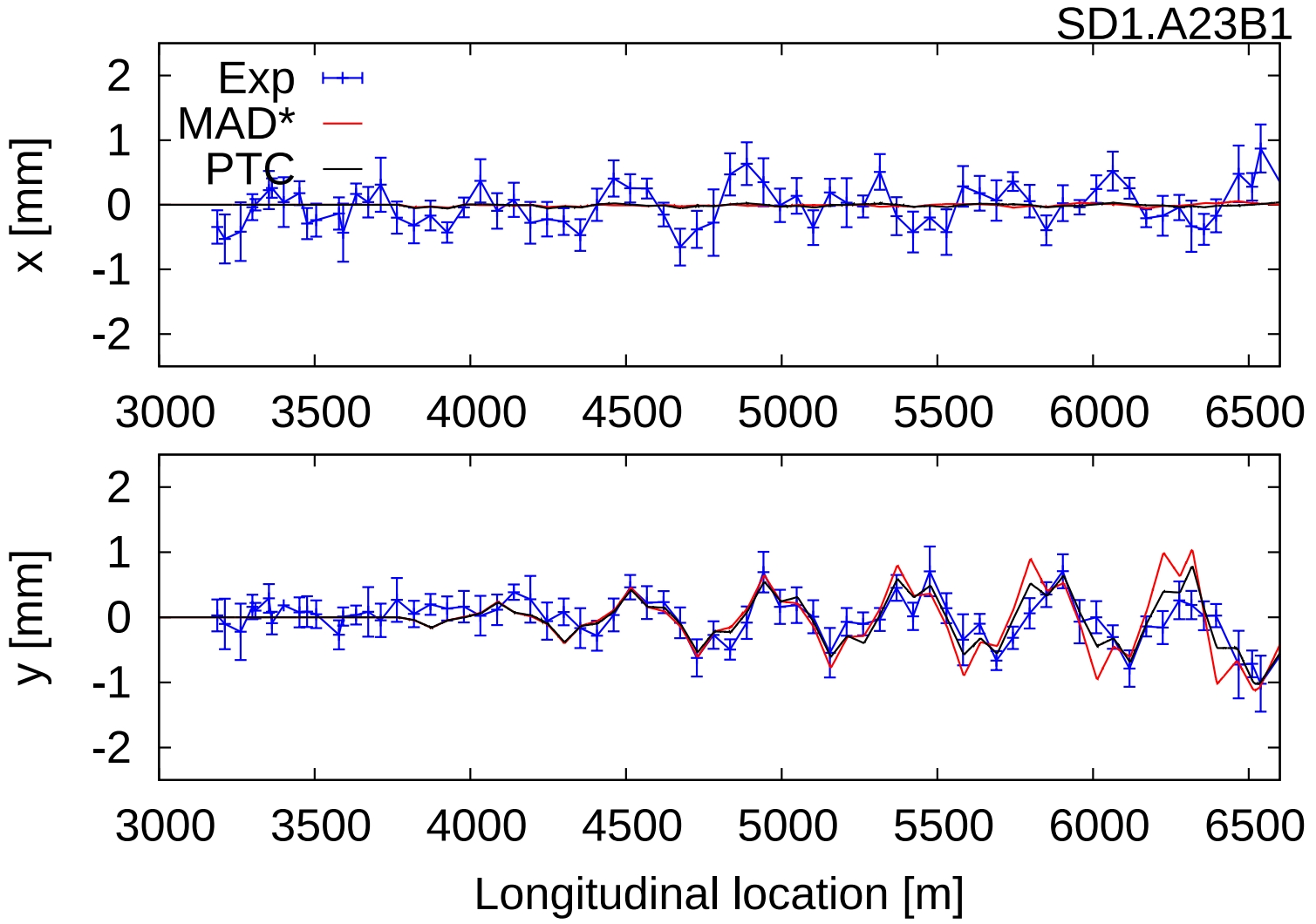
OK (PTC slightly better thanks to b2?)

MQS.23.R2.B1 (corrector: acbch6.r2b1)



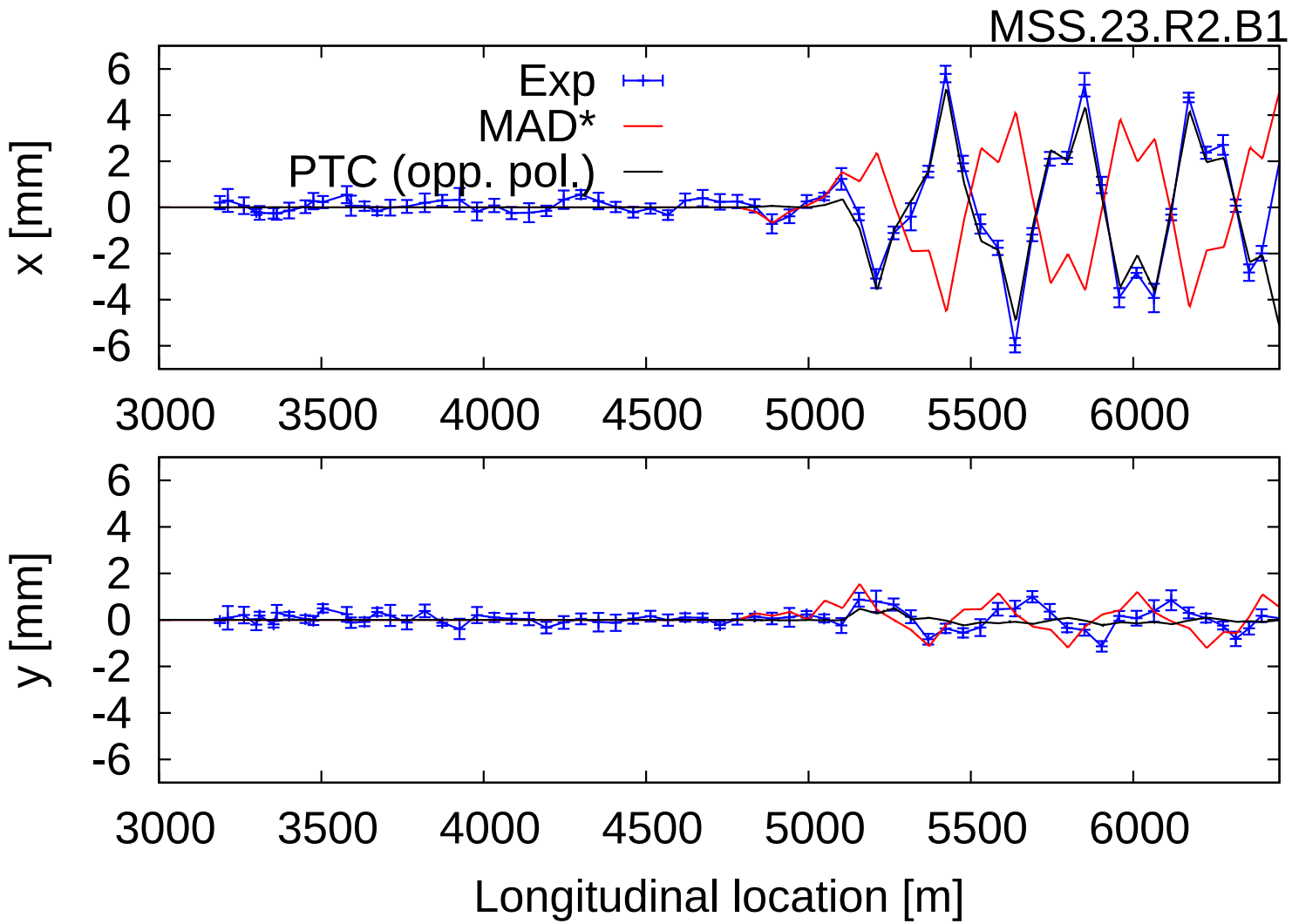
NOT OK

SD1.A23B1 (corrector: acbcv5.r2b1)



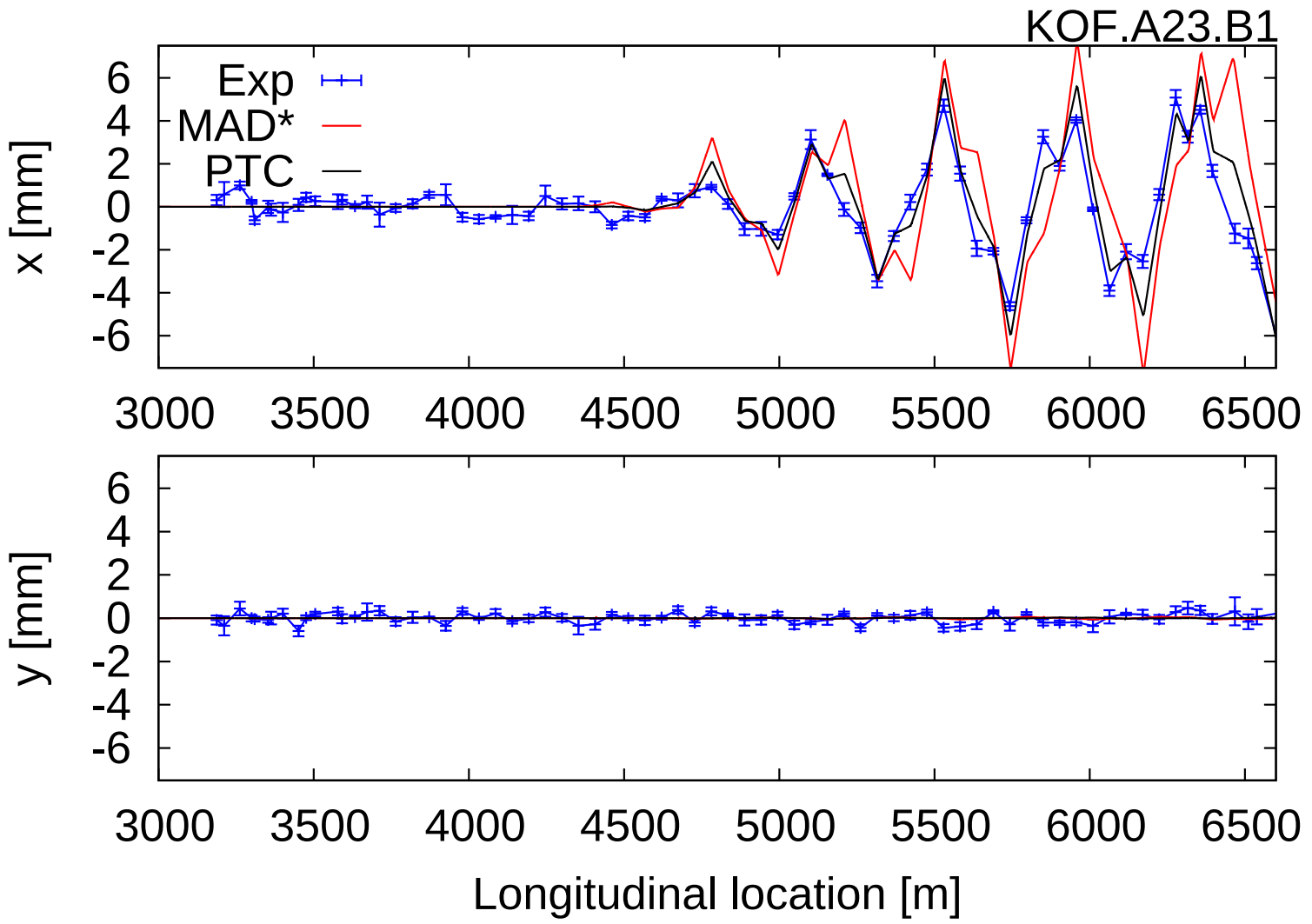
OK (PTC helps a bit)

MSS.23.R2.B1(corrector: acbcv5.r2b1)



NOT OK

KOF.A23.B1 (corrector: acbch6.r2b1)

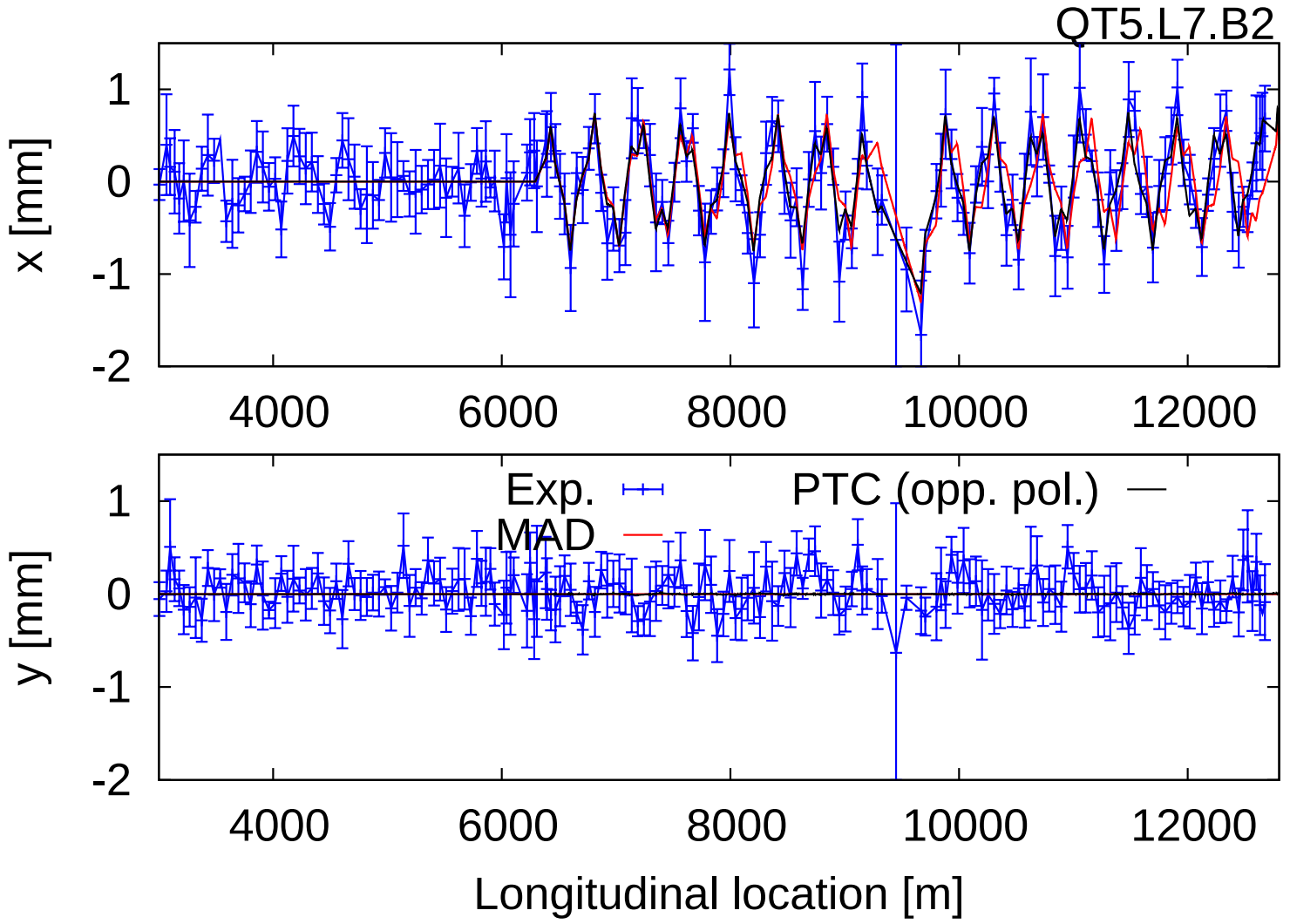


OK (PTC improvement due to b_2 and b_3)

Beam 2

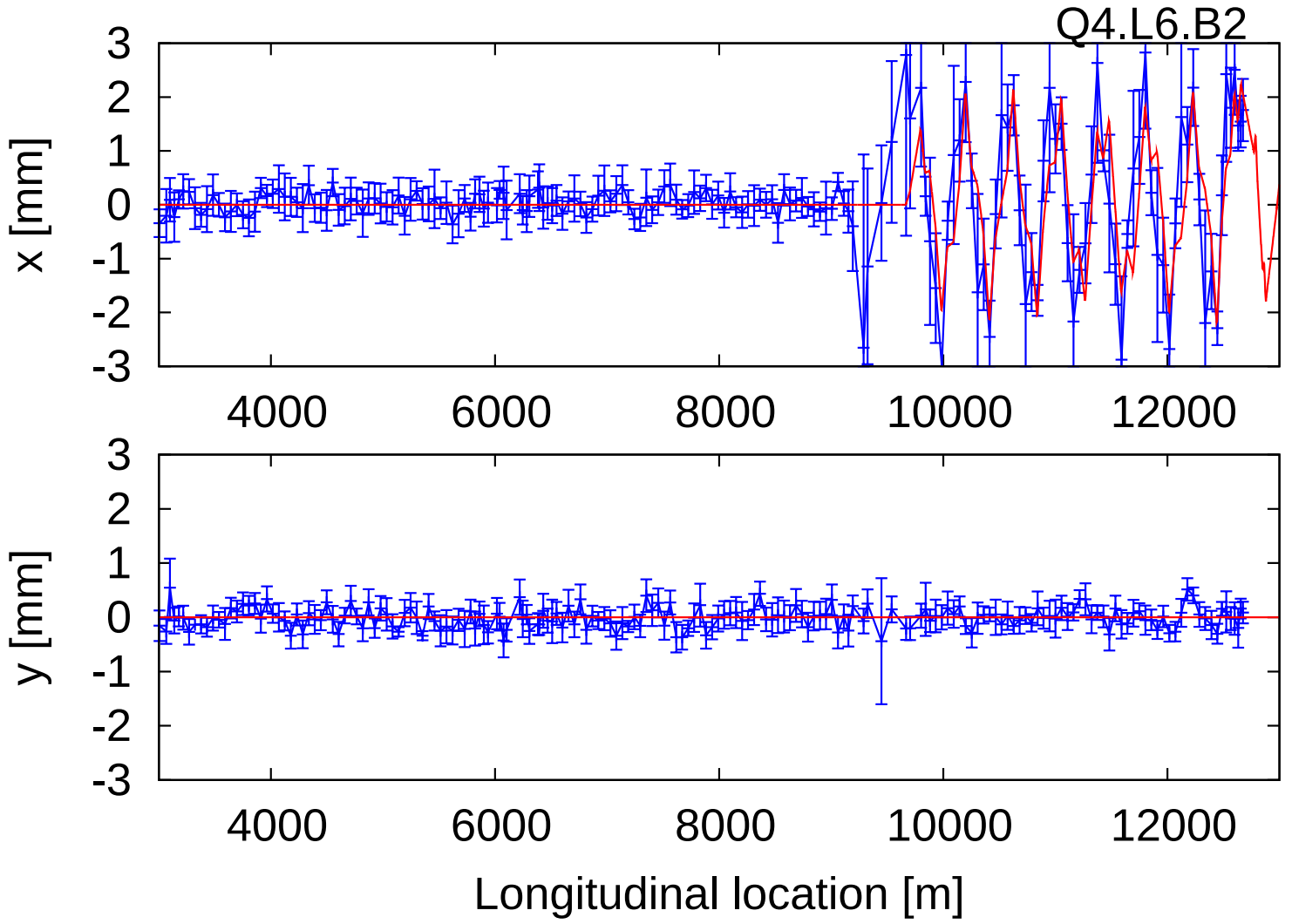
- QT5.L7.B2 (corrector: acbch6.r7b2)
- Q4.L6.B2 (corrector: acbch9.r6b2)
- QTL11.L7B2 (corrector: acbch9.l7b2)
- QT12.L7B2 (corrector: acbcv10.l7b2)
- QT13.L7B2 (corrector: acbh11.l7b2)
- MQS.A78B2 (corrector: acbxv3.l8)
- MQS.A56B2 (corrector: acbyh5.r6b2)
- KCS.A67.B2 (corrector: acbcv6.l7b2)
- MSS.78B2 (corrector: acbcv5.l8b2)
- MSS.56B2 (corrector: kcs.a67b2)

QT5.L7.B2 (corrector: acbch6.r7b2)



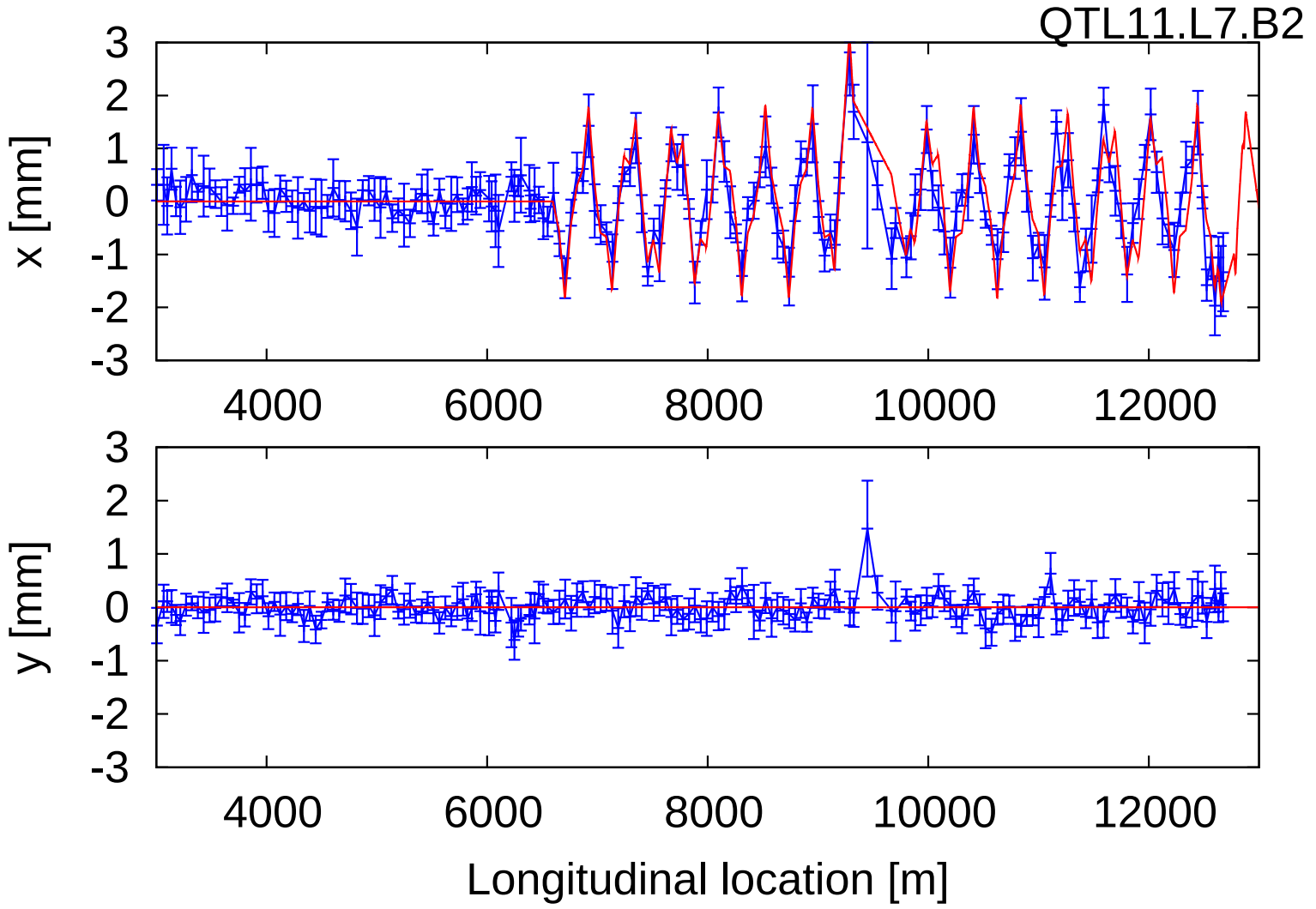
OK (small H negative phase shift fixed by b_2)

Q4.L6.B2 (corrector: acbch9.r6b2)



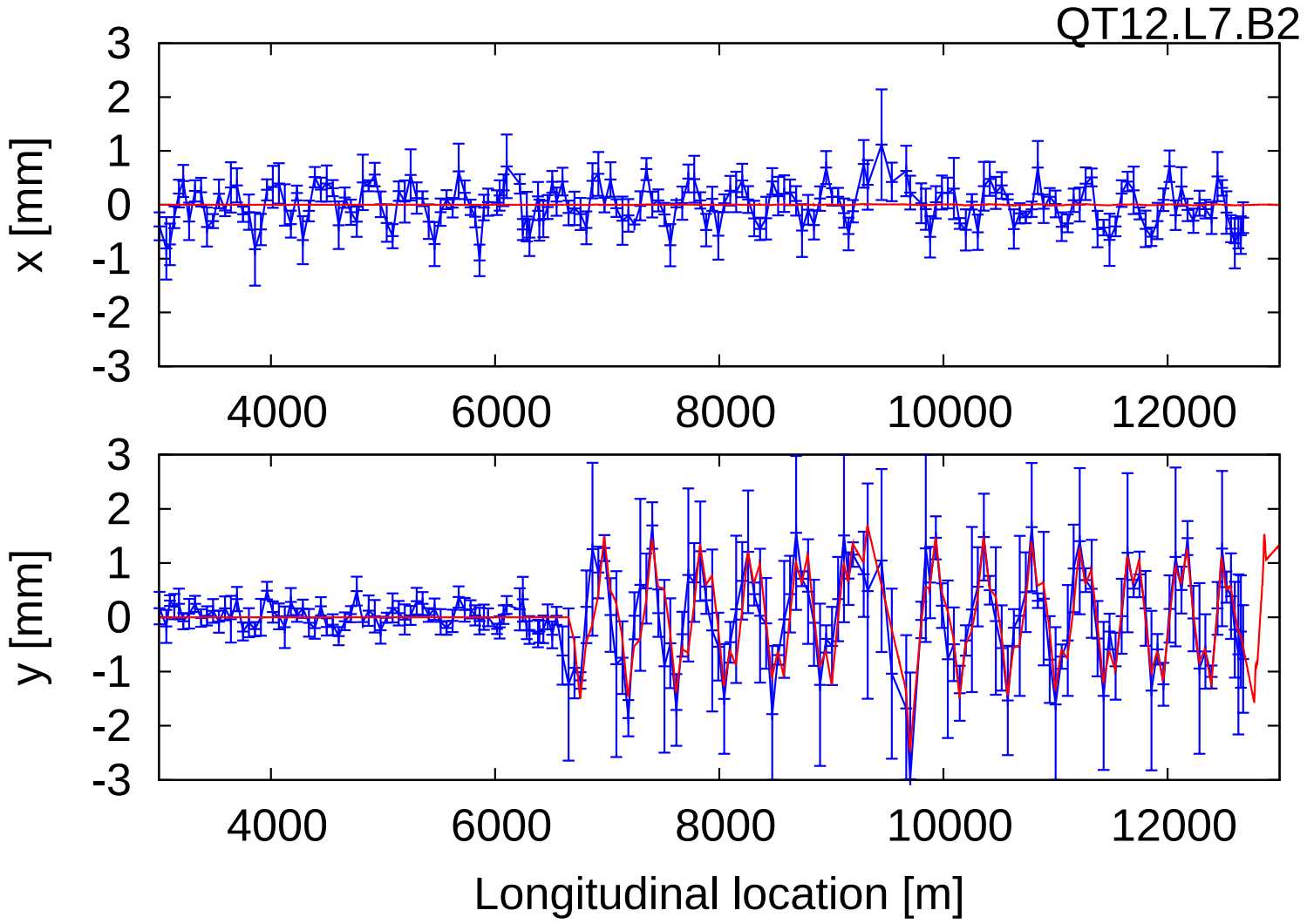
OK

QTL11.L7B2 (corrector: acbch9.l7b2)



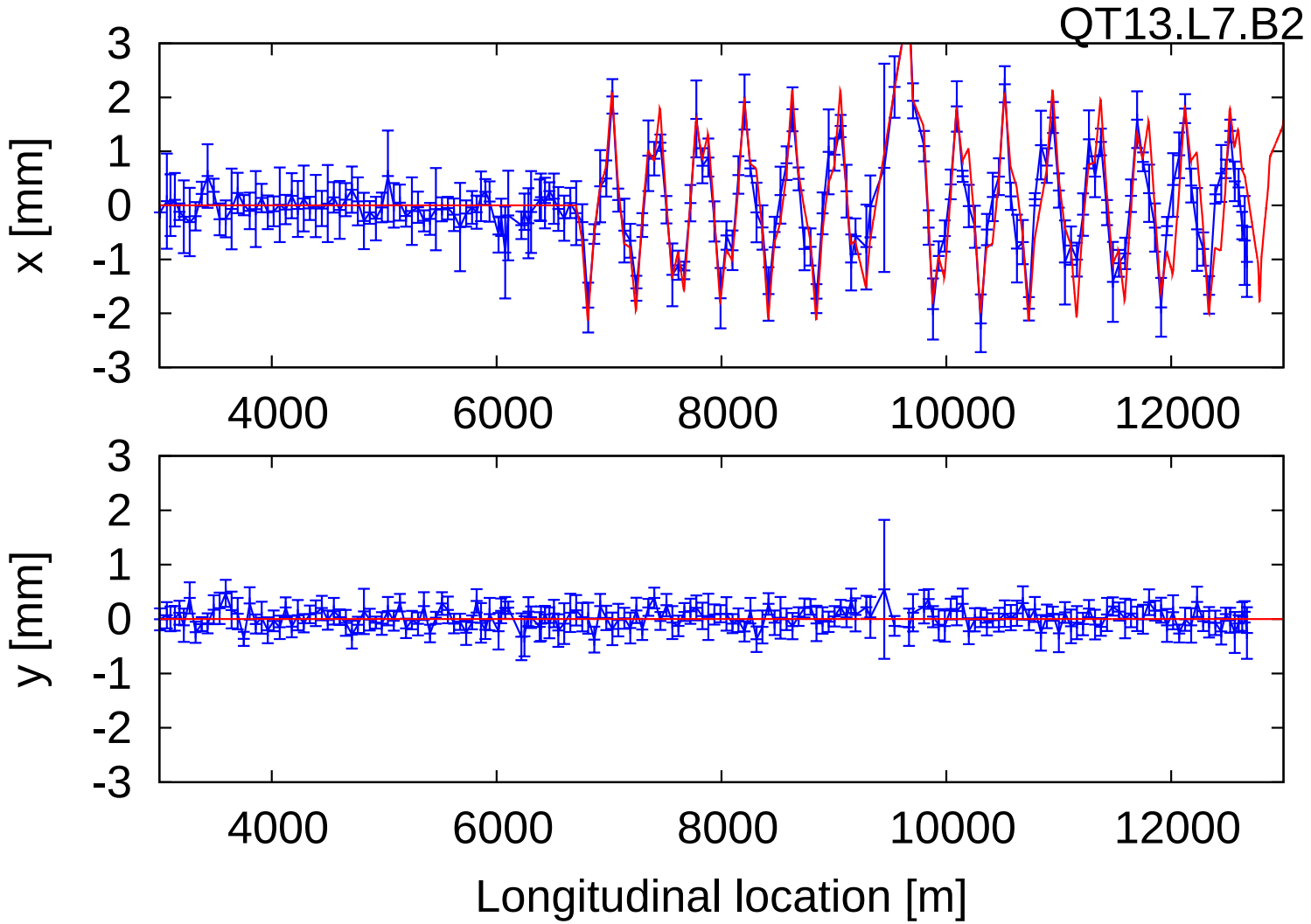
OK

QT12.L7B2 (corrector: acbcv10.l7b2)



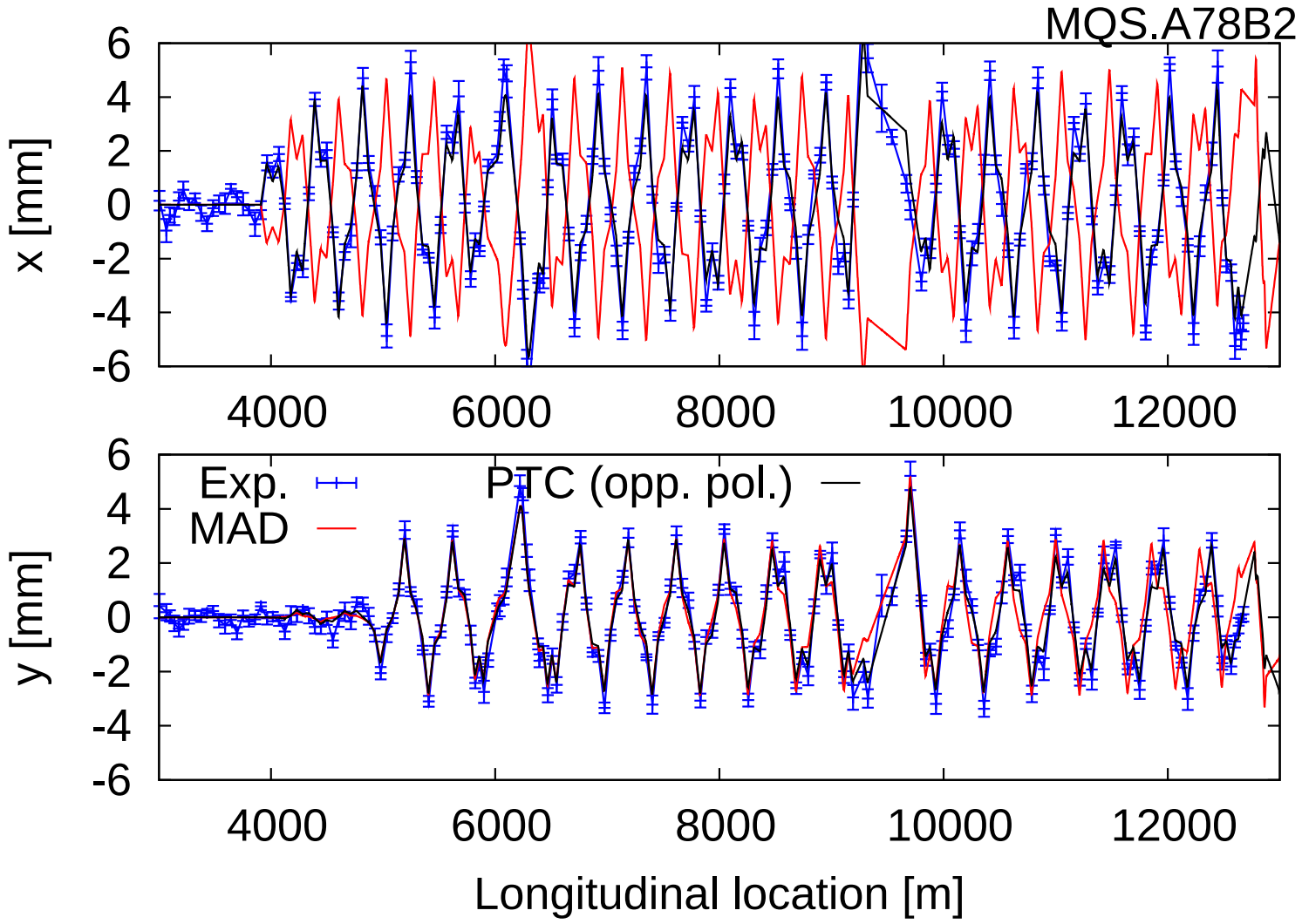
OK

QT13.L7B2 (corrector: acbh11.l7b2)



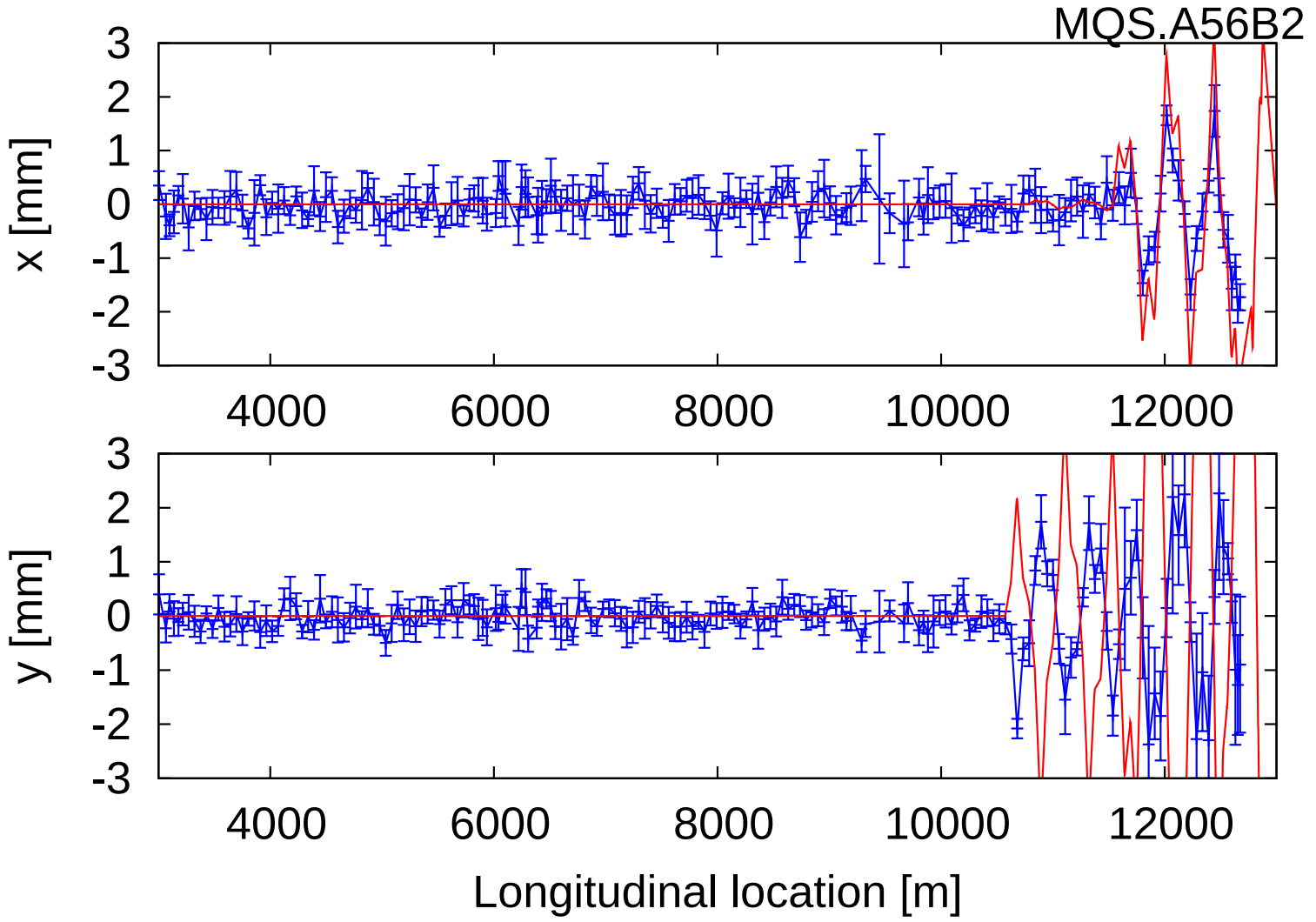
OK

MQS.A78B2 (corrector: acbxv3.l8)



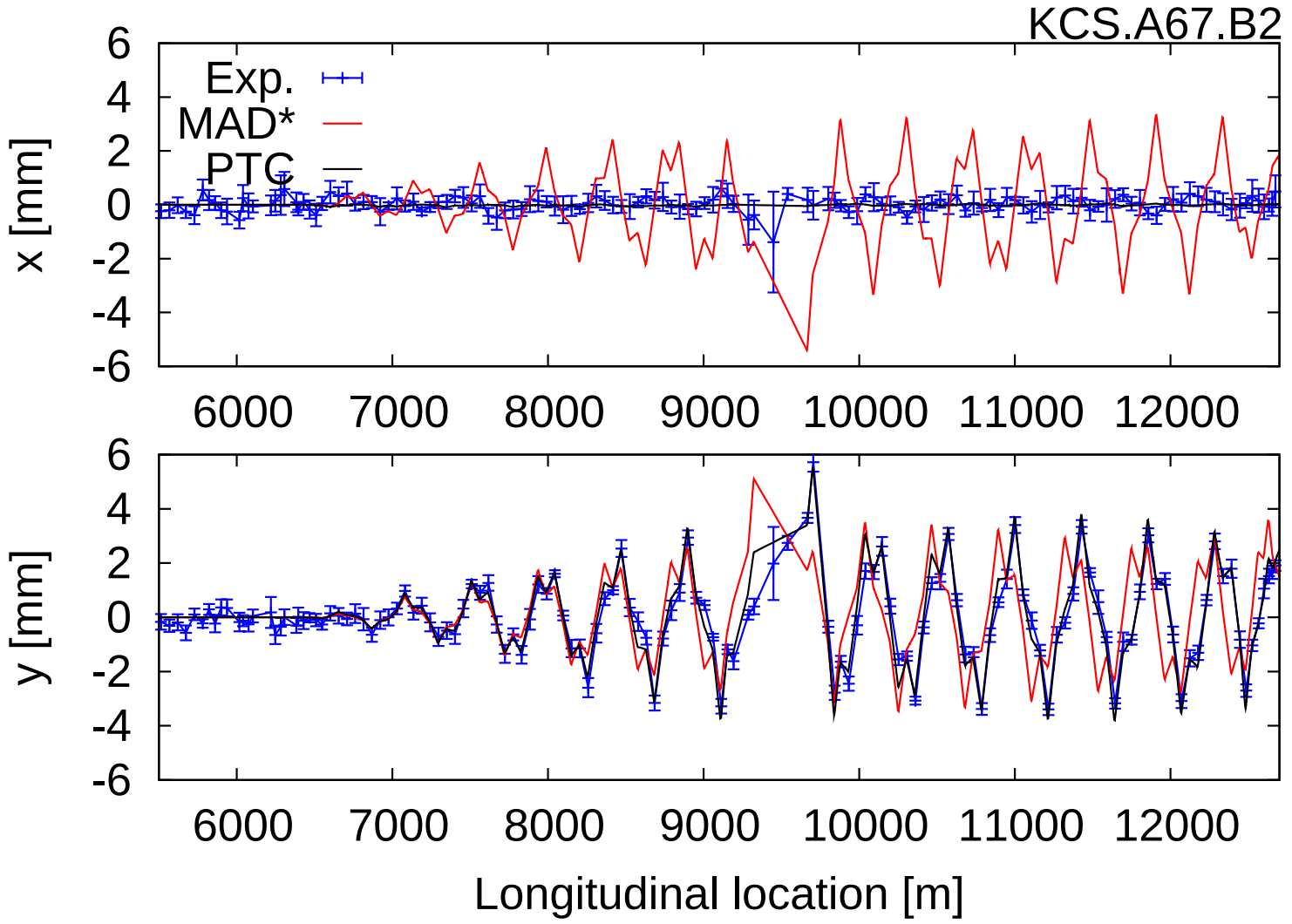
NOT OK (small V positive phase shift fixed by b_2)

MQS.A56B2 (corrector: acbyh5.r6b2)



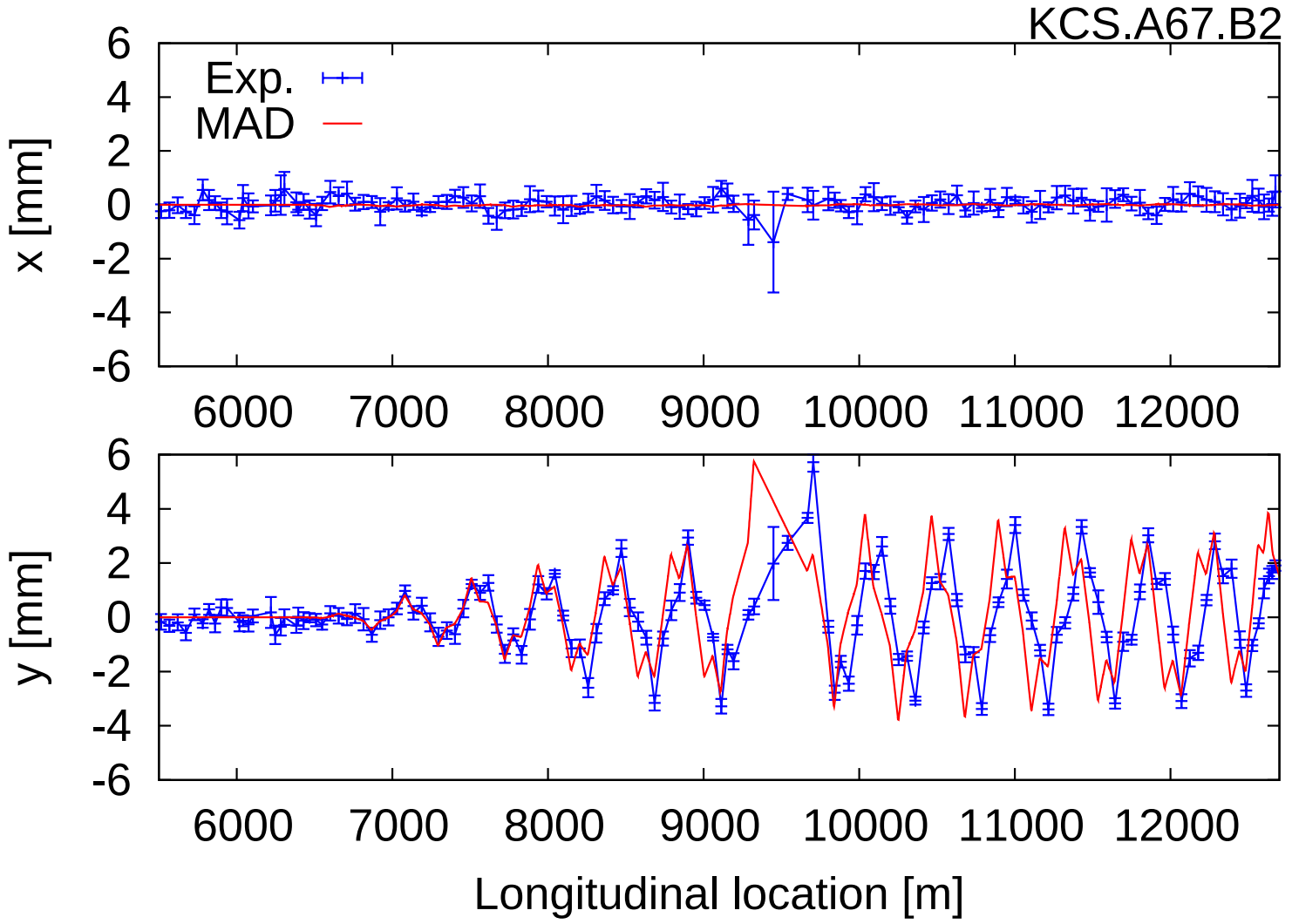
NOT OK

KCS.A67.B2 (corrector: acbcv6.l7b2)



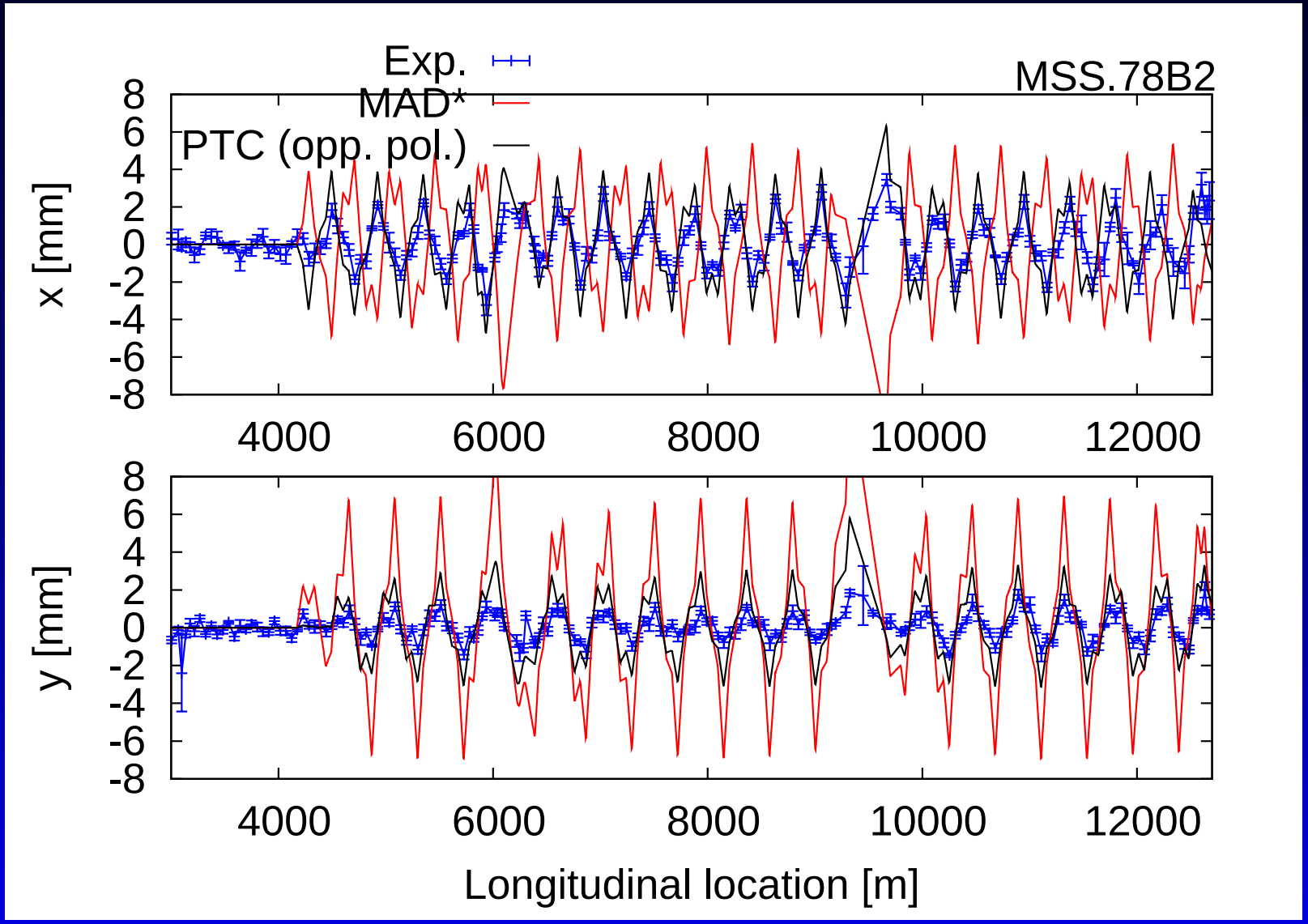
OK (b_3 fixes V phase, procedure fixes H)

KCS.A67.B2 using MAD and right procedur



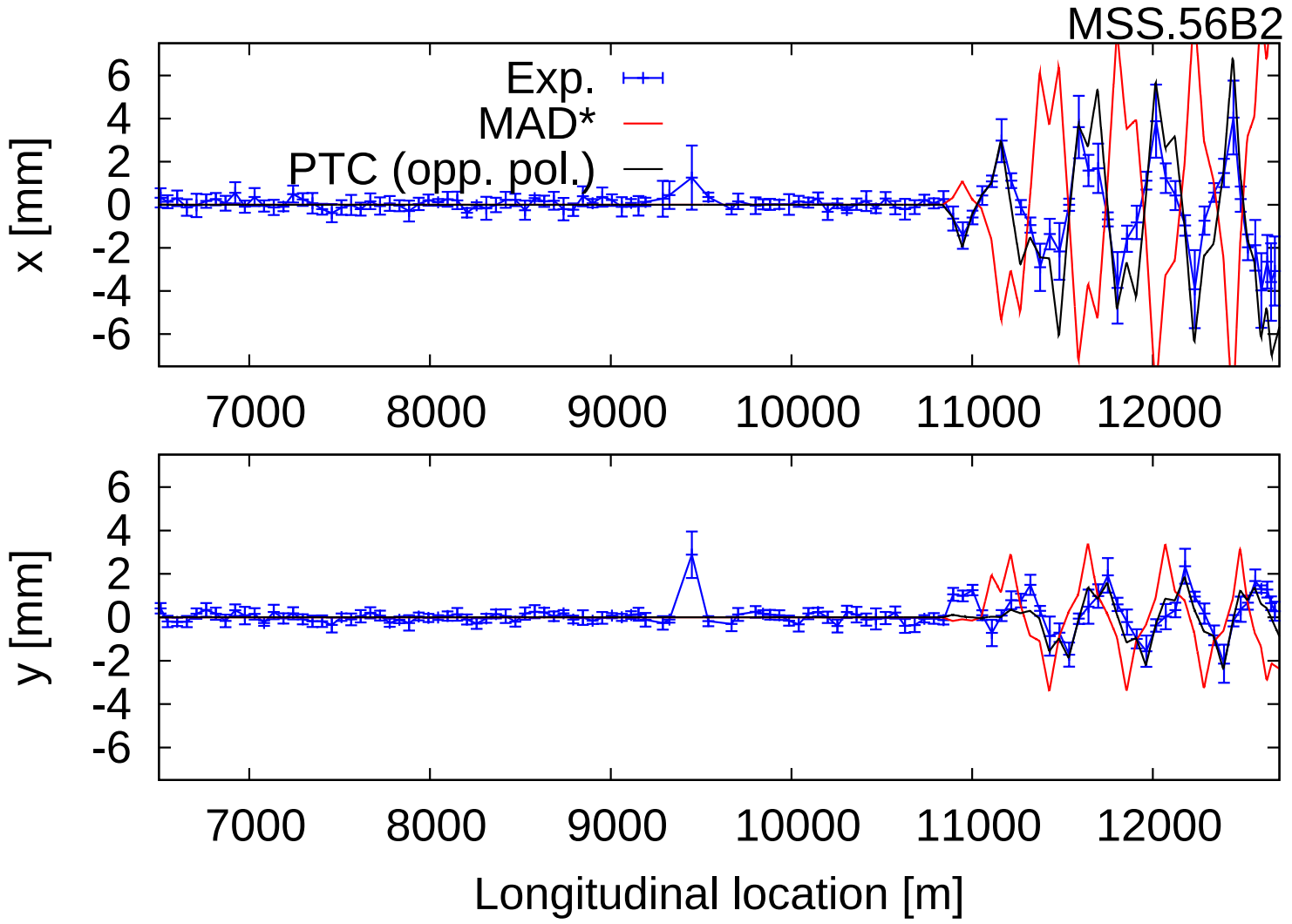
MAD works

MSS.78B2 (corrector: acbcv5.l8b2)



NOT OK (PTC helps a lot but not perfect)

MSS.56B2 (corrector: kcs.a67b2)



NOT OK

Summary

Applicable to all beam1 and beam2 elements tried so far:

- Normal quads, sexts and oct have same polarity convention as MAD
- Skew quads and sexts have opposite polarity
- Beyond the polarity checks these data serve to verify the magnetic model !!

Coupling from aperture measurements

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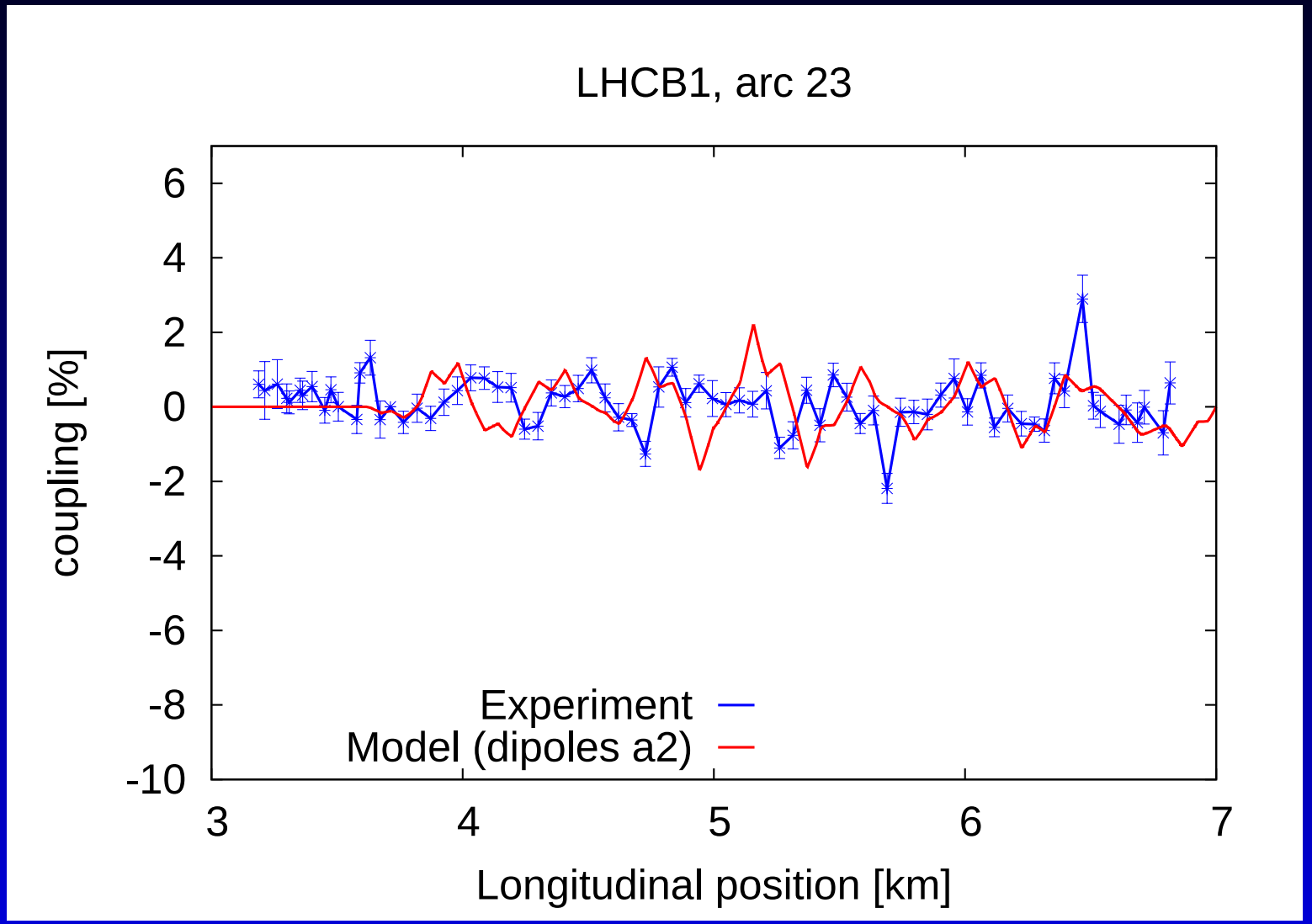
17 November, 2009

Coupling measurement

Thanks to the large horizontal orbit excursion during the aperture measurements we can measure the x-y coupling. We define it as:

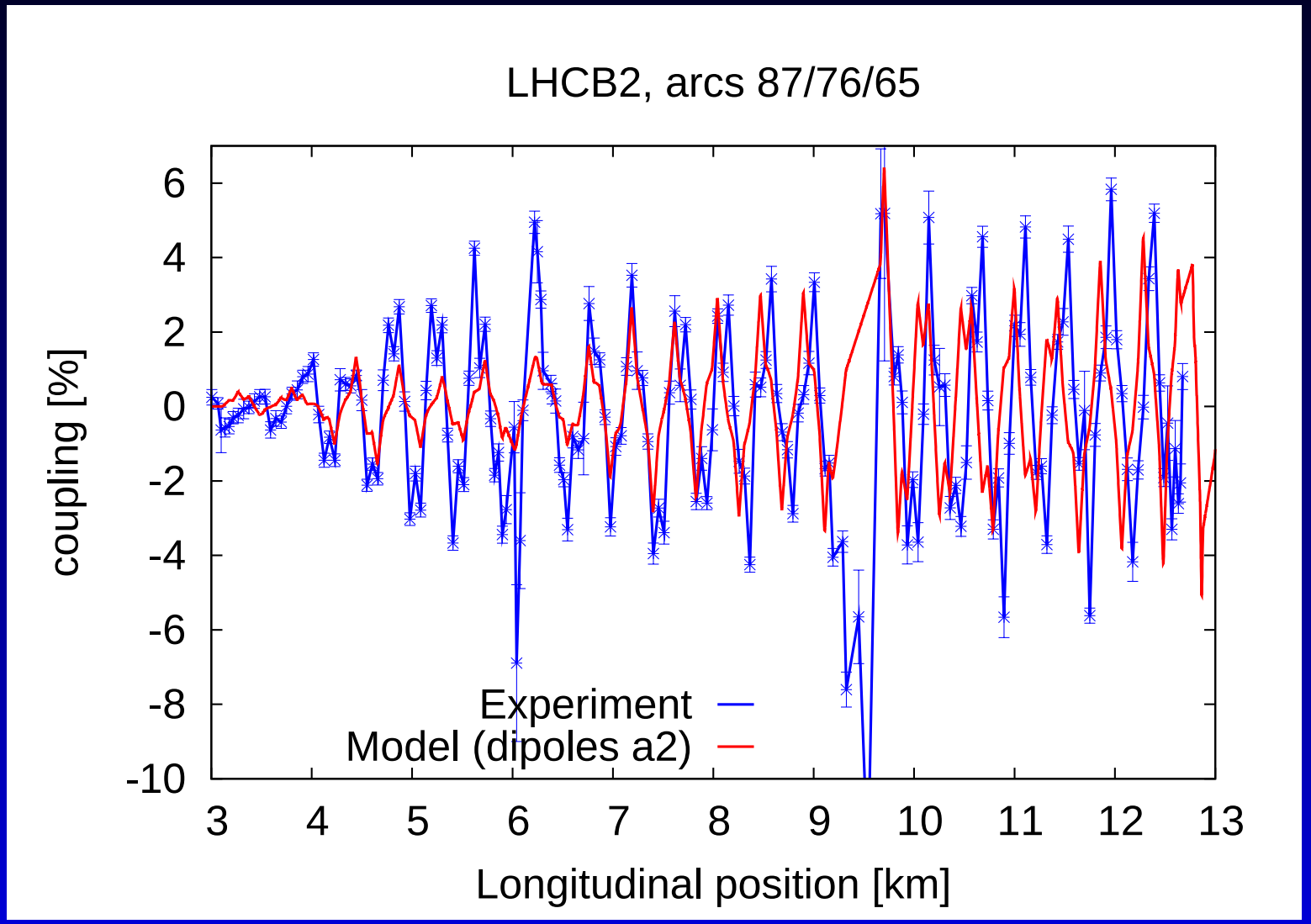
$$\text{Coupling} = \Delta Y(s) \,/\, \Delta X_{QF}$$

Beam 1, arc 23



Rather compatible with zero

Beam 2, arcs 87/76/65



Trend OK but coupling errors missing

Summary

- beam 2 arcs 8-5 show larger coupling than beam 1 arc 23, from measurement and from preliminary models (considering the dipoles a2).
- This verifies to some level the Wise a2 components

From the two presentations maybe we have verified b2, a2 and b3 !! (to some level)