

2007 SPS Nonlinear chromaticity measurements

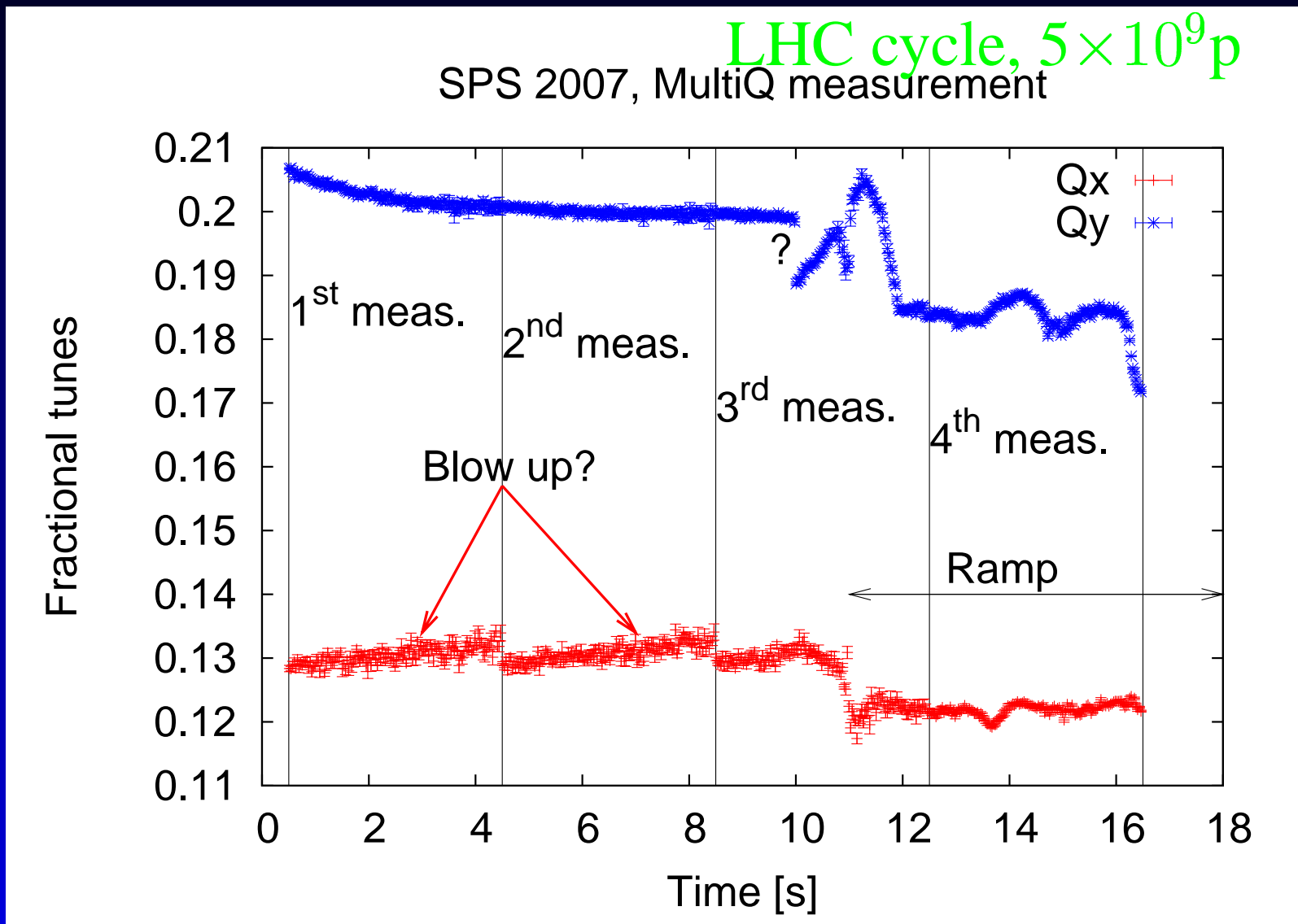


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F. Schmidt, R. Tomás

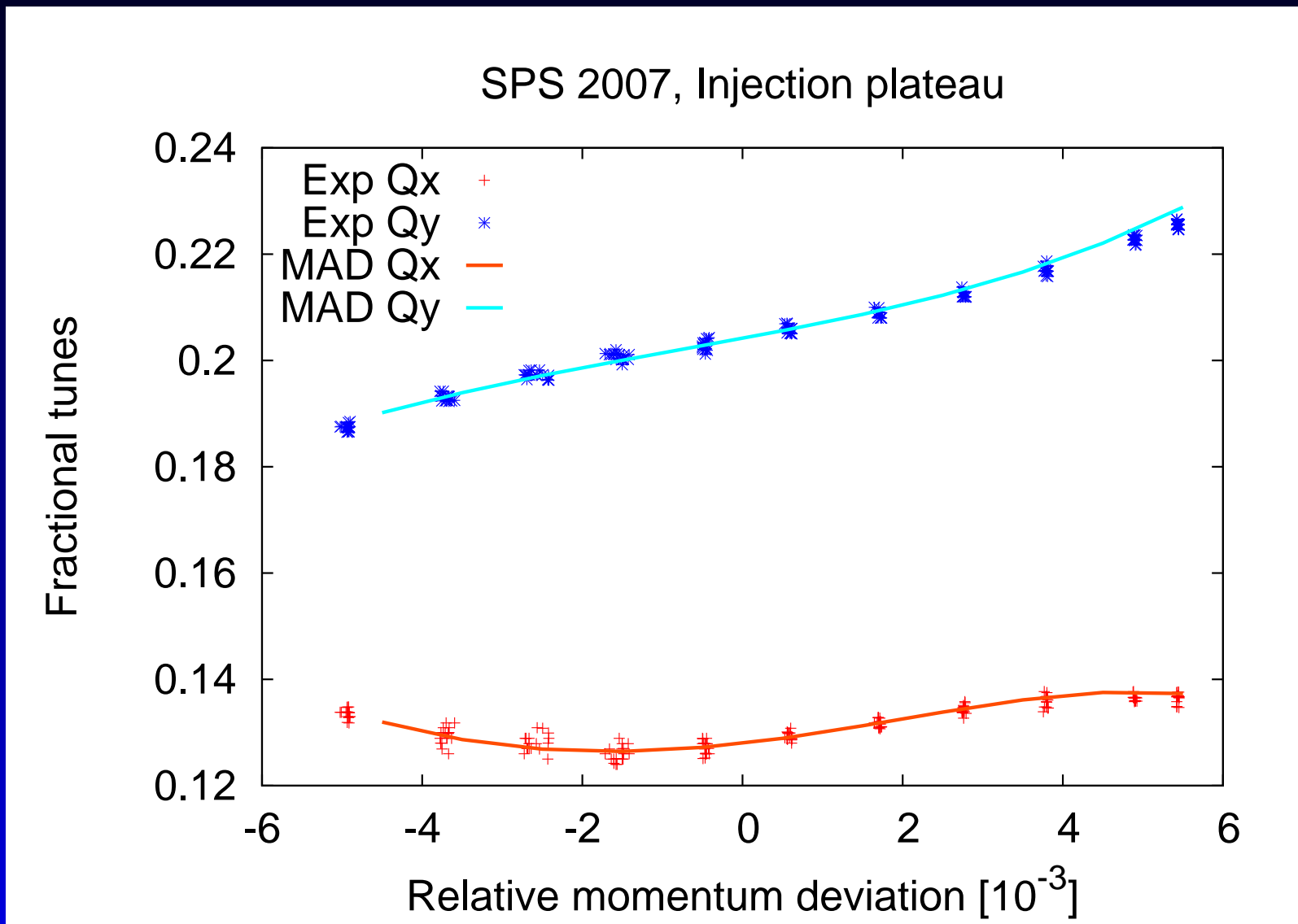
Thanks to V. Kain, G. Rumolo, R. Steinhagen and
J. Wenninger

LIS - 23rd of July 2007

Measurement in 2007



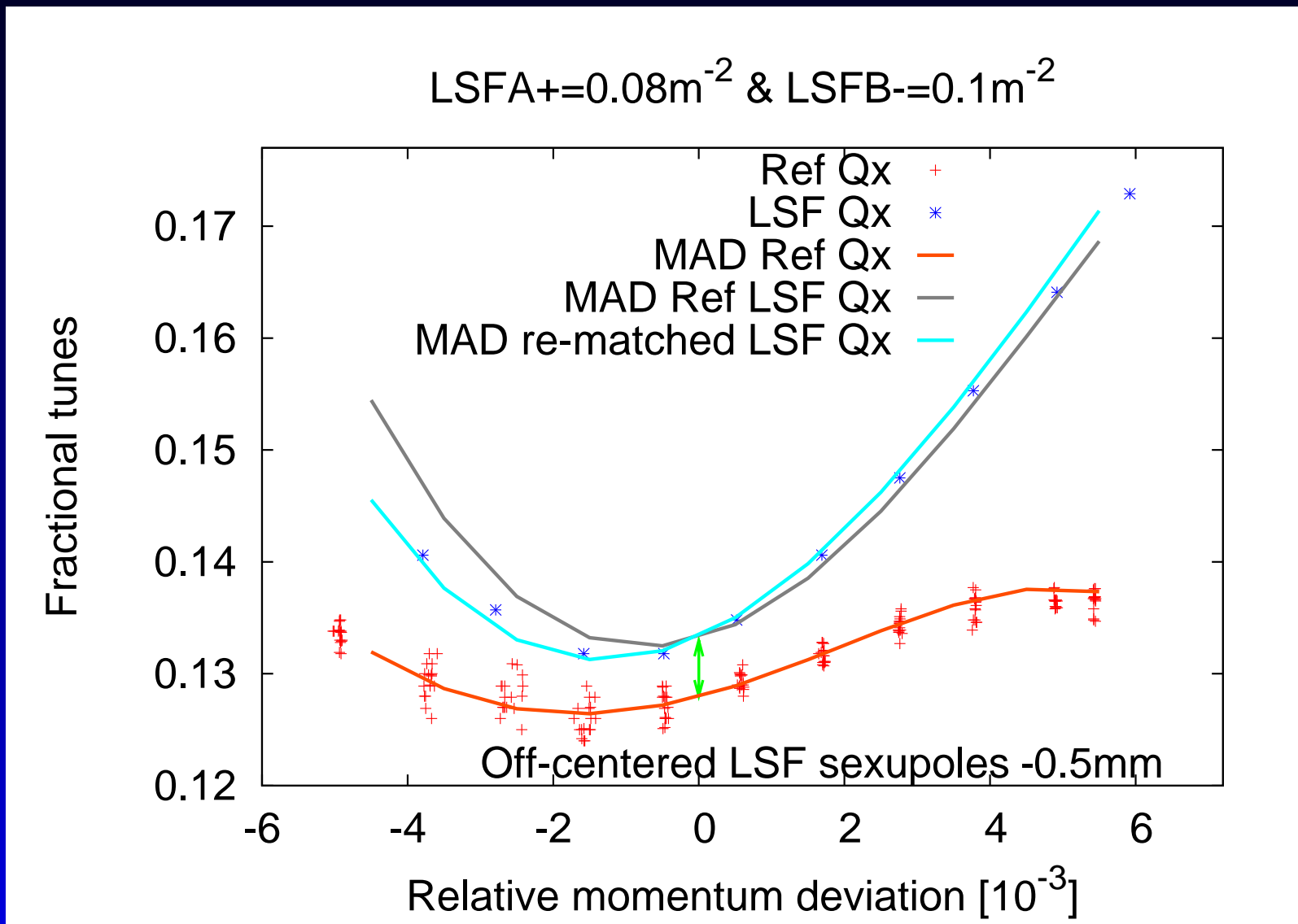
Flatbottom



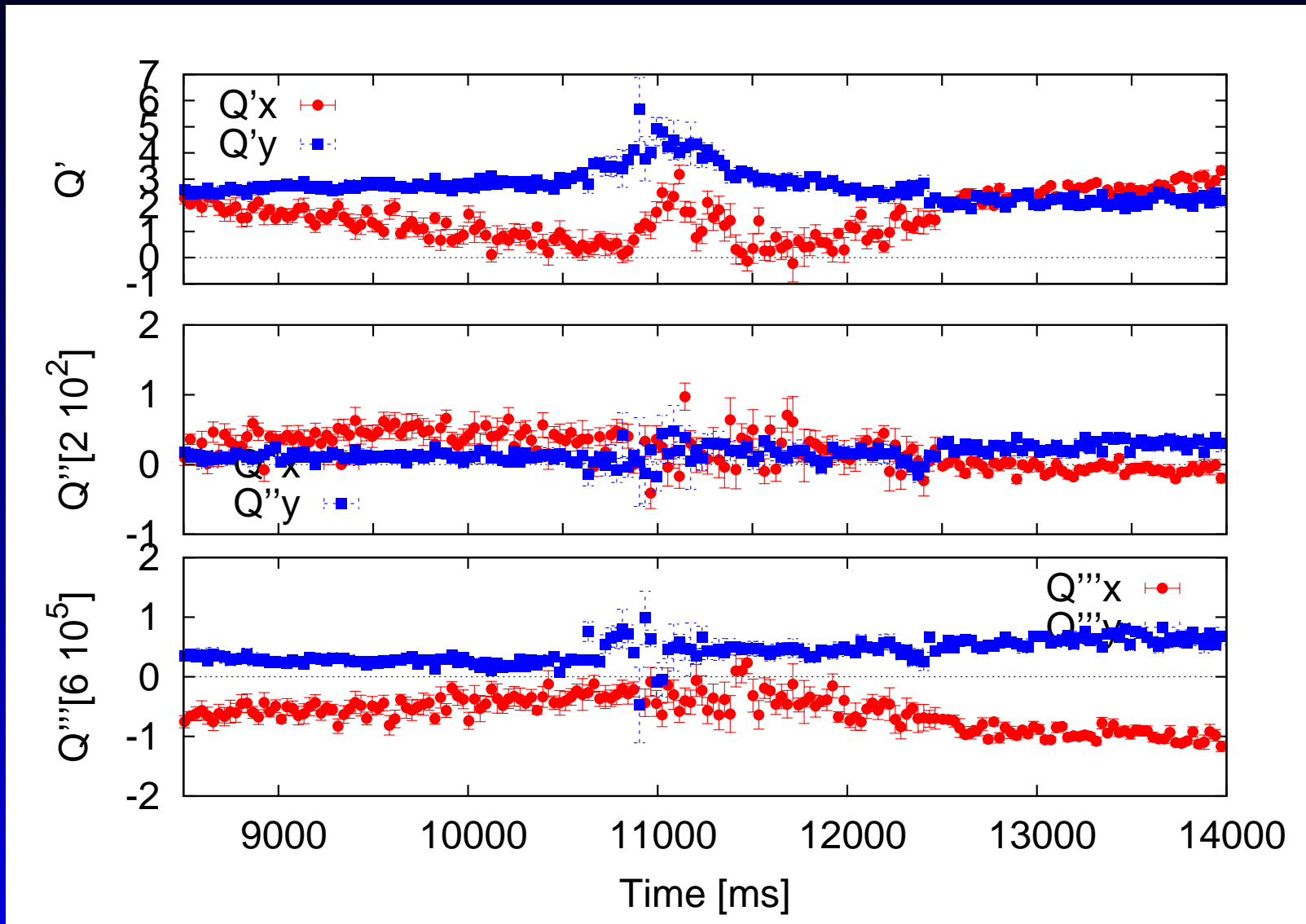
Results

	2002	2004	2006*	2007
b3a	0.00073	-0.00038	-0.00058	-0.00013
b3b	-0.00262	-0.00103	-0.00128	-0.00001
b4f	0.0915	-0.0054	0.0612	0.0668
b4d	0.0115	-0.2260	-0.2730	-0.305
b5a	-7.5	6.9	9.2	5.43
b5b	-7.2	5.6	-11.8	2.4
b6f	-1548	-243	0	-390
b6d	-5571	1728	0	195
b7a	0.0	-69138	0	0
b7b	0.0	5992	0	0

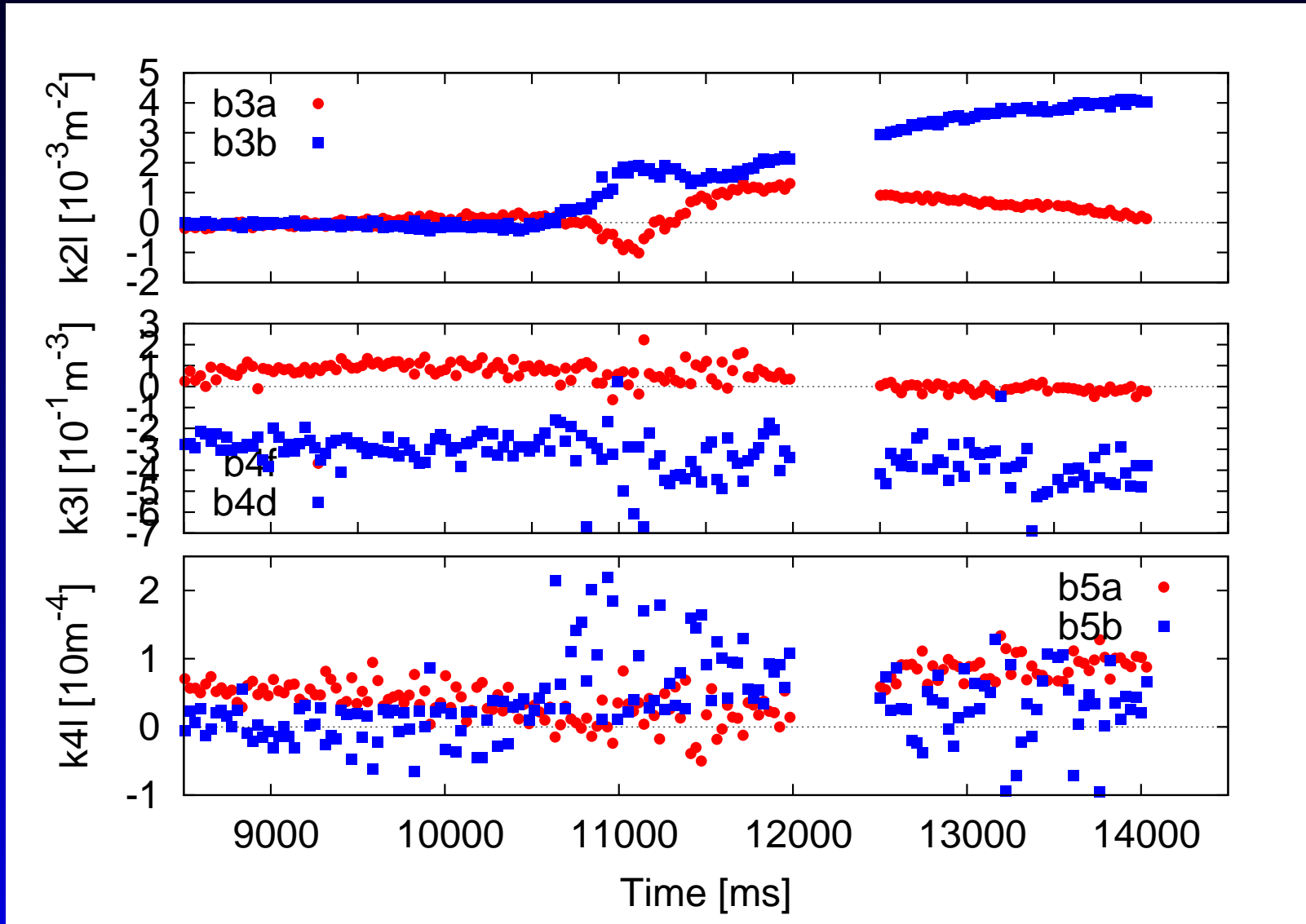
Flatbottom, different LSFA & LSFB



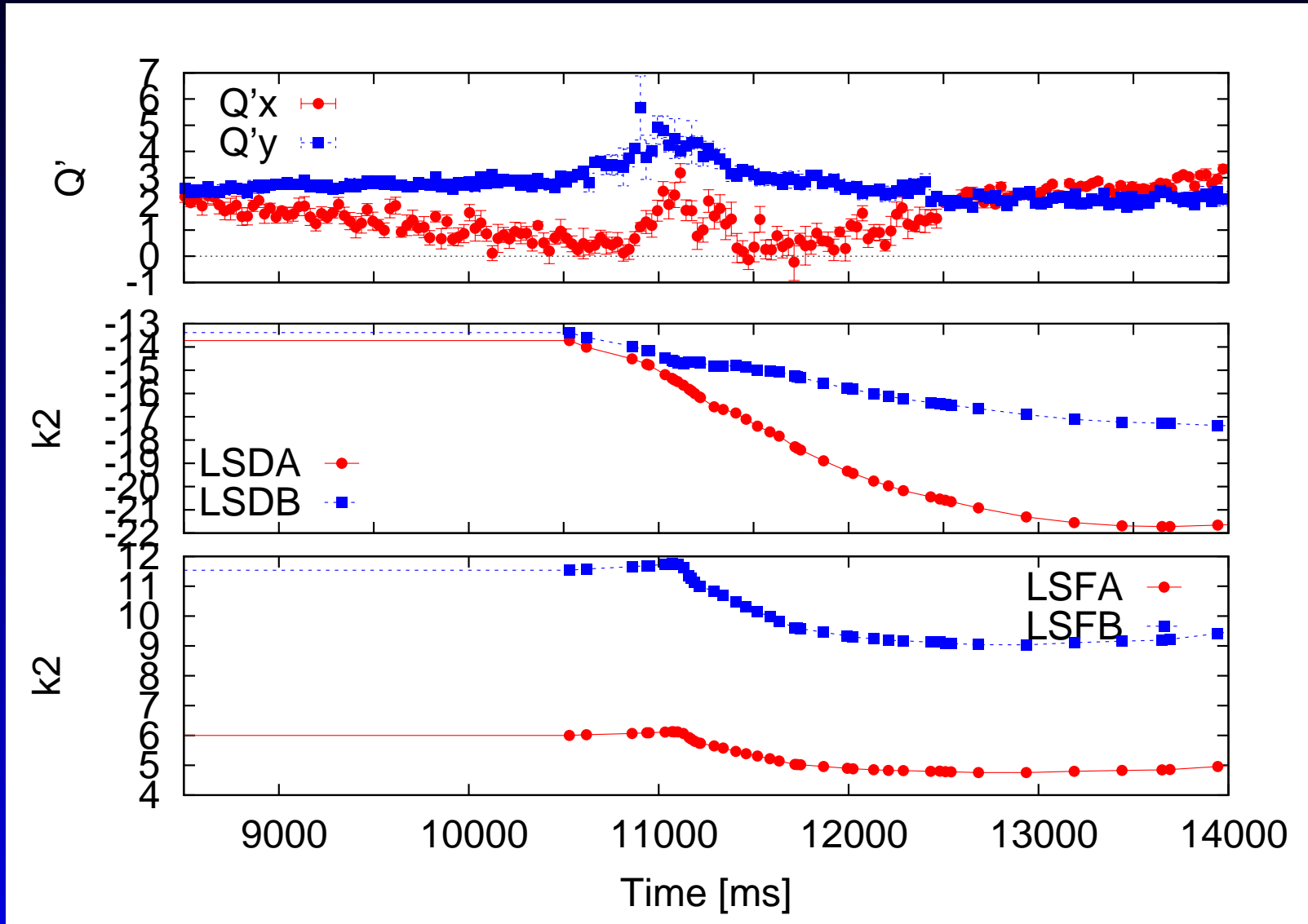
From flatbottom to ramp I



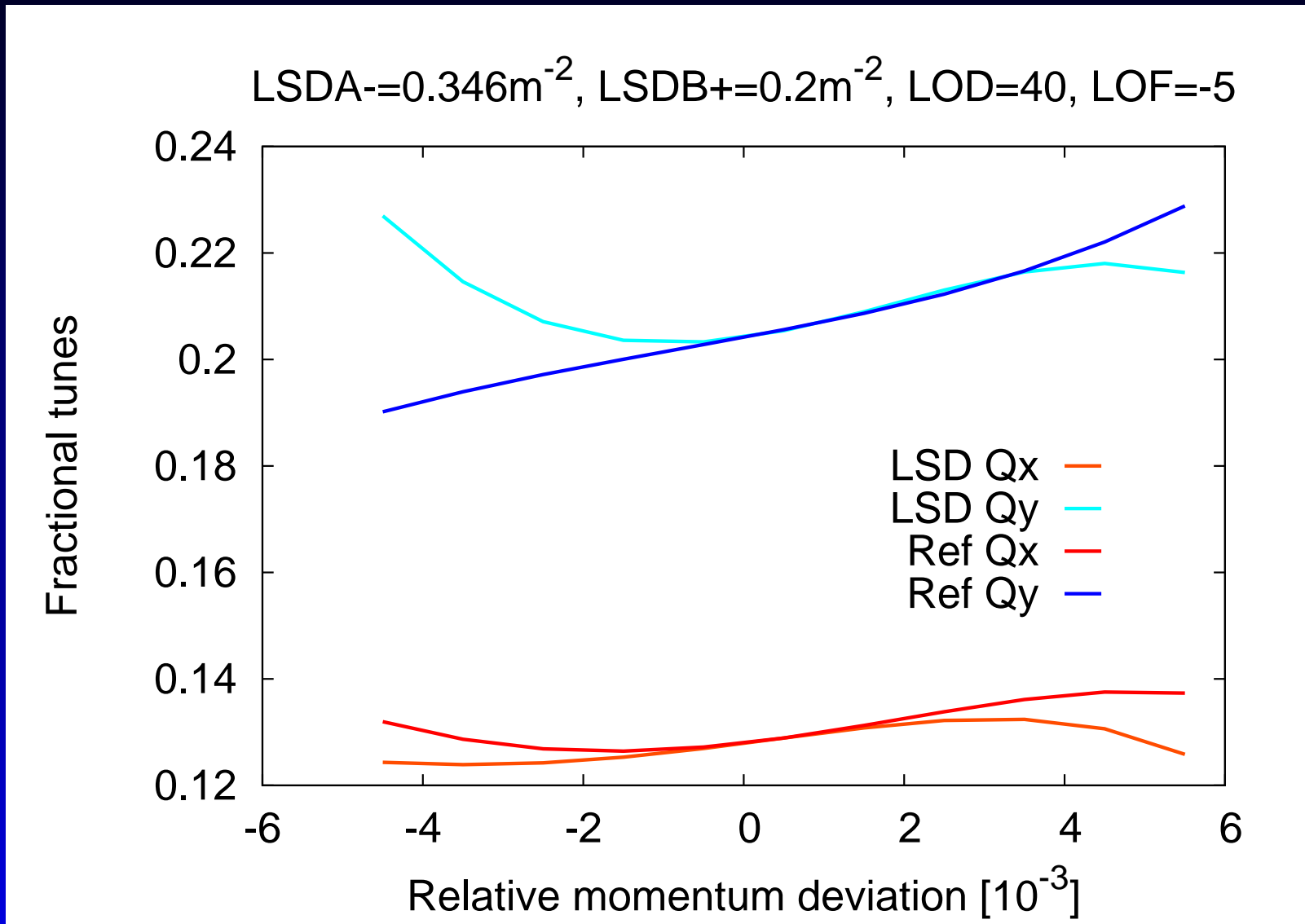
From flatbottom to ramp II



From flatbottom to ramp III



Flatbottom, simulated new LSDA & LSDB



Conclusions

- Possible blow-up in the horizontal plane due to the MultiQ -> PLL next time?
- Different sextupole configurations at flatbottom show partial agreement with same errors model.
- Chromaticity peak right at the start of the ramp
- Possible reduction of the vertical tune chromatic span using sextupoles and octupoles.

Distribution of magnetic errors

error	sextupole		decapole		14-pole		octupole		12-pole	
chrom	$Q'_{x,y}$		$Q'''_{x,y}$		$Q''''_{x,y}$		$Q''_{x,y}$		$Q''''_{x,y}$	
var-name	b3a	b3b	b5a	b5b	b7a	b7b	b4f	b4d	b6f	b6d
element	mba	mbb	mba	mbb	mba	mbb	qf	qd	qf	qd
type	Main Dipoles						Main Quads			

$Q_{0x,y}$ matched via main quads. Octupolar error in quads is not natural but may arise from gravitational deformations.