Realignment and Orbit Correction in the PSB

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Overview

LS1 realignment campaign

Comparison of measured and model orbit

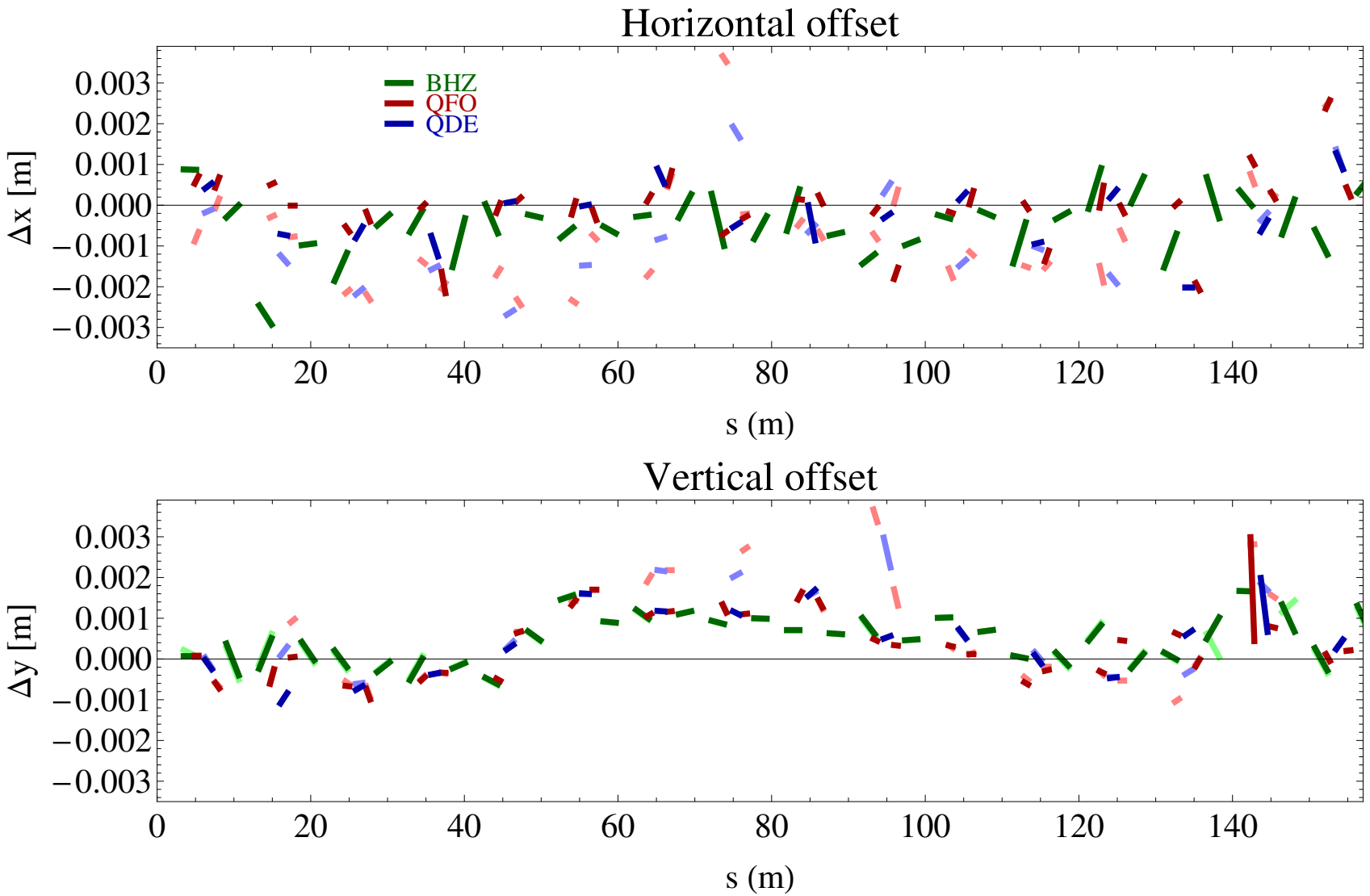
Alignment adjustment to reduce vertical orbit excursion

Correction of orbit with steering magnets

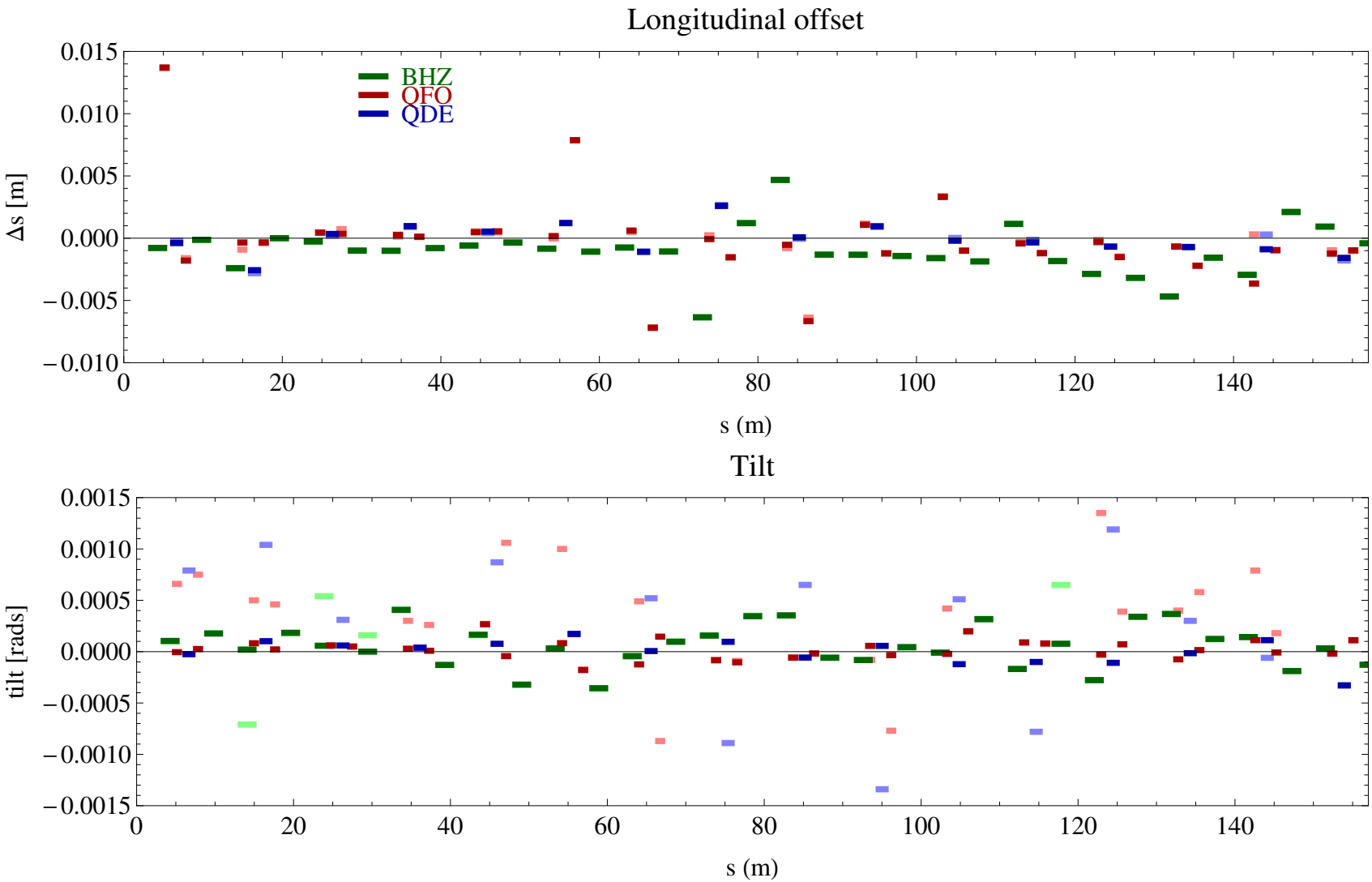
Further realignment plans

Summary

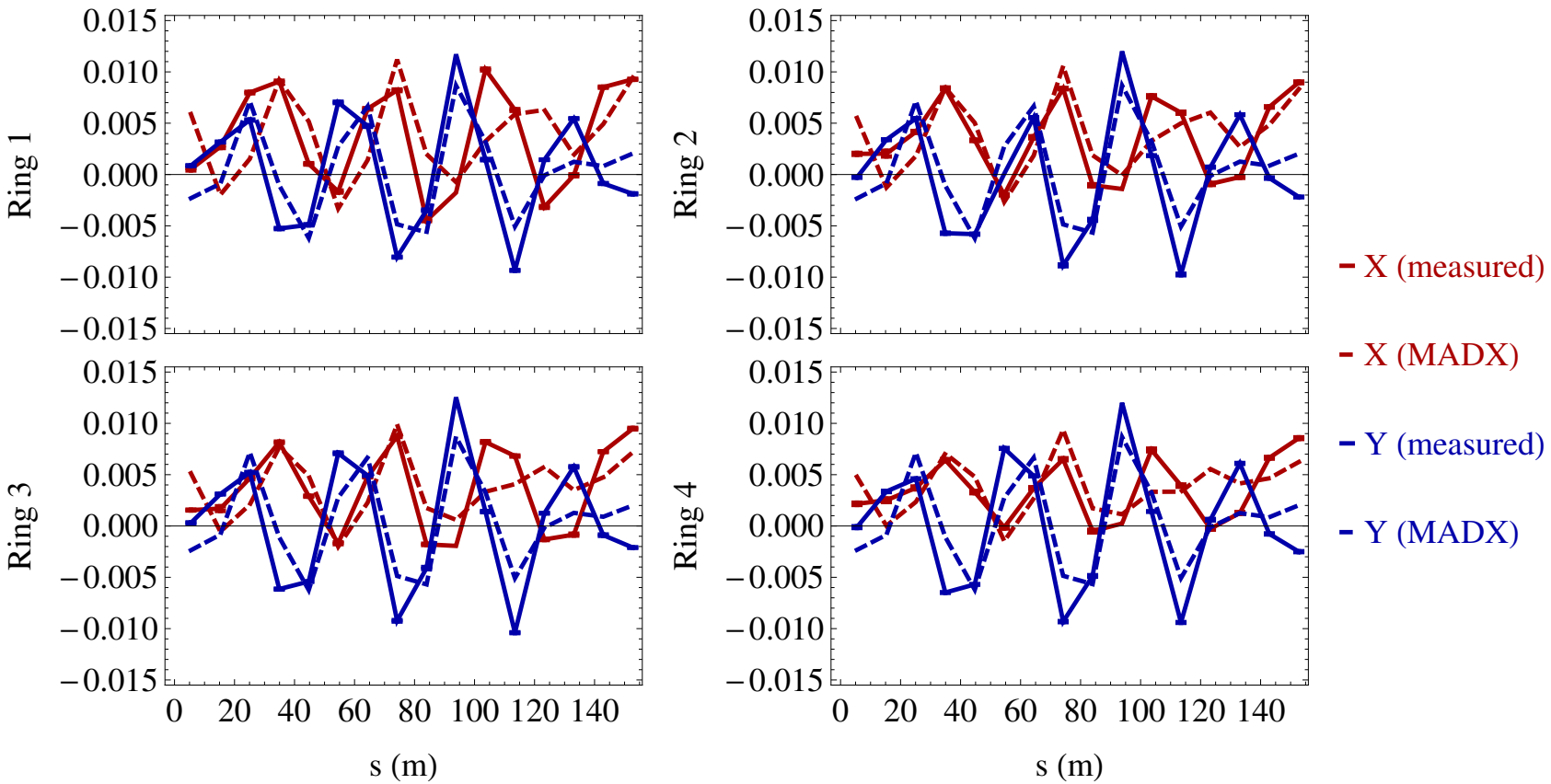
LS1 realignment campaign - transverse displacements



LS1 realignment campaign - long. displacements and tilts



Measured and MADX orbit after LS1 realignment



Radiation survey - hot spot in section 10

Booster Radiation Survey 2014

Débits de doses mesurés le 29/10/2014, ~4 heures après arrêt faisceau

Anneau Booster

Section	Element	Couloir	Amont*	Aval
Unité		µSv/h		
Distance		2 m	40 cm	
BR 1	BHZ 11	176	1971	1258
	QDE 1	80	132	141
	BHZ 12	33	132	76
BR 2	BHZ 21		34	19
	QDE 2	12	9	8
	BHZ 22	8	20	5
BR 3	BHZ 31		6	60
	QDE 3	11	8	11
	BHZ 32	106	27	83
BR 4	BHZ 41		155	23
	QDE 4	12	10	9
	BHZ 42	4	32	10
BR 5	BHZ 51		7	22
	QDE 5	5	3	6
	BHZ 52	4	19	6
BR 6	BHZ 61		8	20
	QDE 6	3	4	3
	BHZ 62	2	28	5
BR 7	BHZ 71		3	13
	QDE 7	2	3	4
	BHZ 72	18	6	0
BR 8	BHZ 81		59	95
	QDE 8	36	35	94
	BHZ 82	18	71	61
BR 9	BHZ 91		40	89
	QDE 9	16	19	20
	BHZ 92	19	21	20
BR 10	BHZ101		27	2035
	QDE 10	108	282	165
	BHZ102	46	531	108
BR 11	BHZ111		129	30
	QDE 11	11	11	10
	BHZ112	8	13	13
BR 12	BHZ121		6	5
	QDE 12	4	5	4
	BHZ122	3	12	2
BR 13	BHZ131		3	10
	QDE 13	3	8	5
	BHZ132	5	6	7
BR 14	BHZ141		7	38
	QDE 14	30	22	28
	BHZ142	171	160	1122
BR 15	BHZ151		319	483
	QDE 15	99	131	77
	BHZ152	56	179	71
BR 16	BHZ161		75	70
	QDE 16	52	32	64
	BHZ162	176	172	122

Color code:

> 100	µSv/h
> 200	µSv/h
> 500	µSv/h
> 2000	µSv/h

Autres lignes

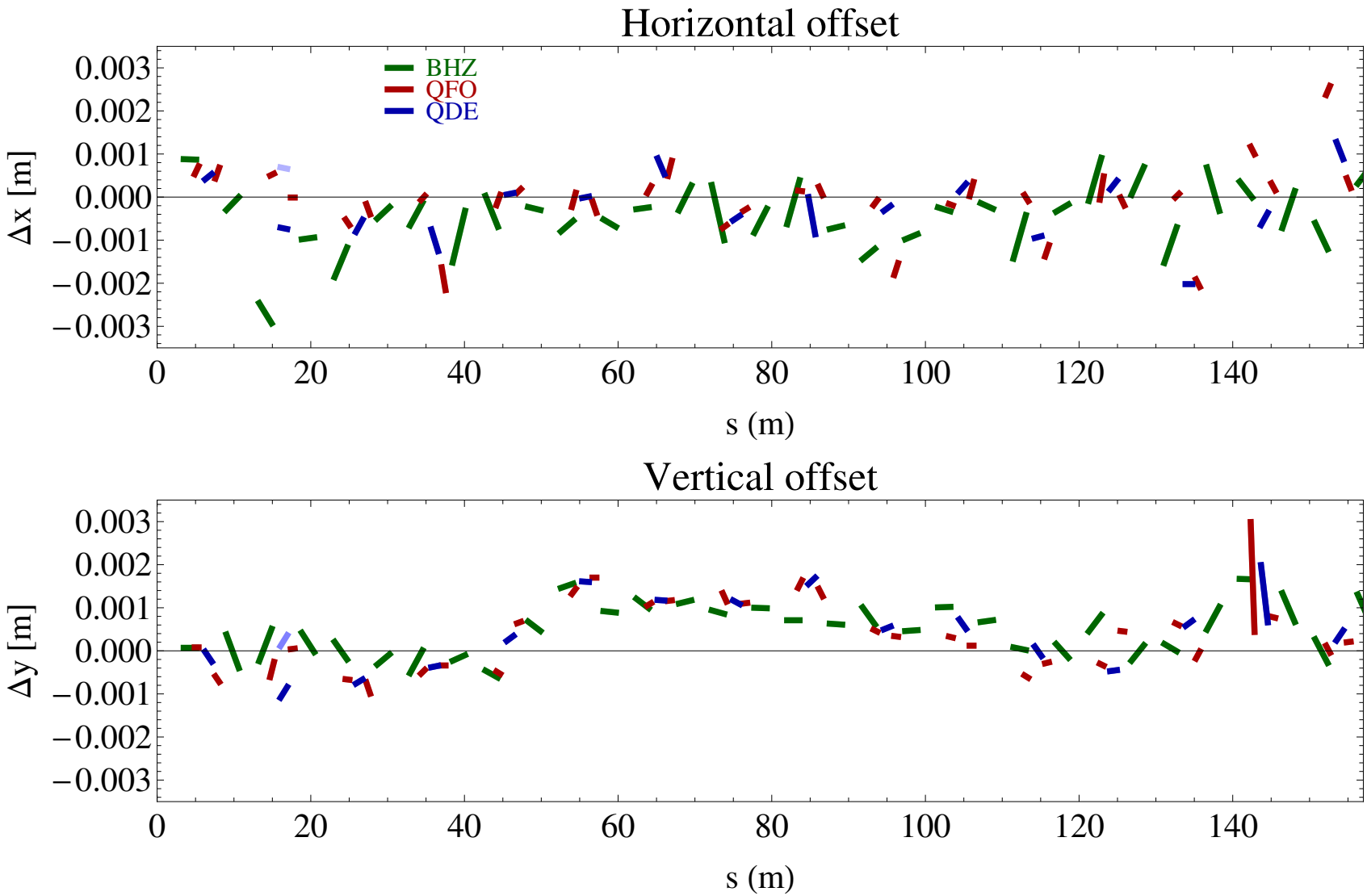
Ligne	Element	Amont	Aval
Unité		µSv/h	
Distance		40 cm	
BI	UMA20	17	15
	DVT30	14	
	QNO30	30	102
	QNO40	143	411
	DIS		143
	DIS.Pb	91	77
	SMV	268	177
	BVT		103
	QNO50		47
	QNO60		50
	UMA40		54
	TRA20		61
	UMA50		72
BT	BVT10	140	
	SMV10		
	QNO10	243	
	QNO20	100	113
	KFA10	73	46
	DVT30		47
	SMV20	129	579
	QNO30		196
	TRA	241	263
	DVT50		177
	KFA20	215	98
	QNO40	85	0
	QNO50	43	36
	BHZ10	34	17
	MTV10		28
BTM	BHZ10	72	61
	QNO10		33
	QNO20	30	25
	SGV1	10	
	SGV2	13	
	SGV3	24	
	DUMP	107	
BTY	BVT101	24	13
	QDE104	14	14
	QFO108	12	9
	QDE113	6	4
	BVT116	5	94
	QFO119	64	37
	QDE120	40	36
	QFO122	34	29
	QFO148	4	5
	QDE151	5	4
	QFO153	5	4

If you have any questions concerning radiation protection, please call:
Pour tout renseignement concernant la radioprotection, veuillez contacter:

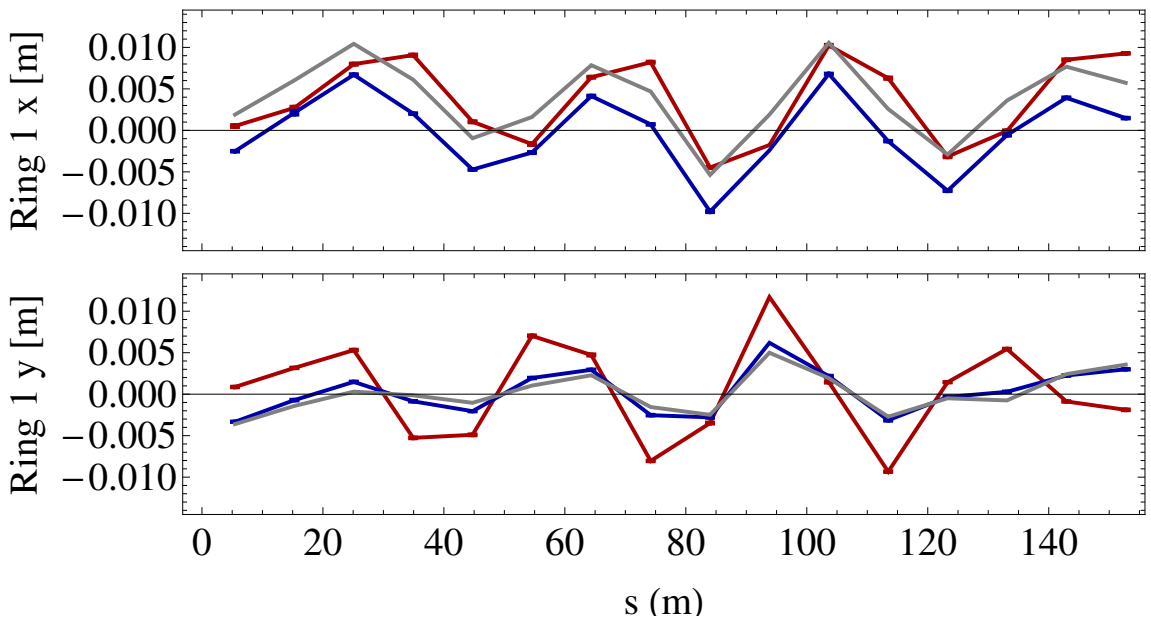
Phone: 72504

* Booster Ring: QDE upstream position corresponds to the measurement performed downstream to the previous QFO
Anneau Booster: la position amont QDE correspond à la mesure effectuée en aval du précédent QFO

Realignment of QDE2 to reduce orbit excursion in sec. 10



Predicted and measured orbit after QDE2 move

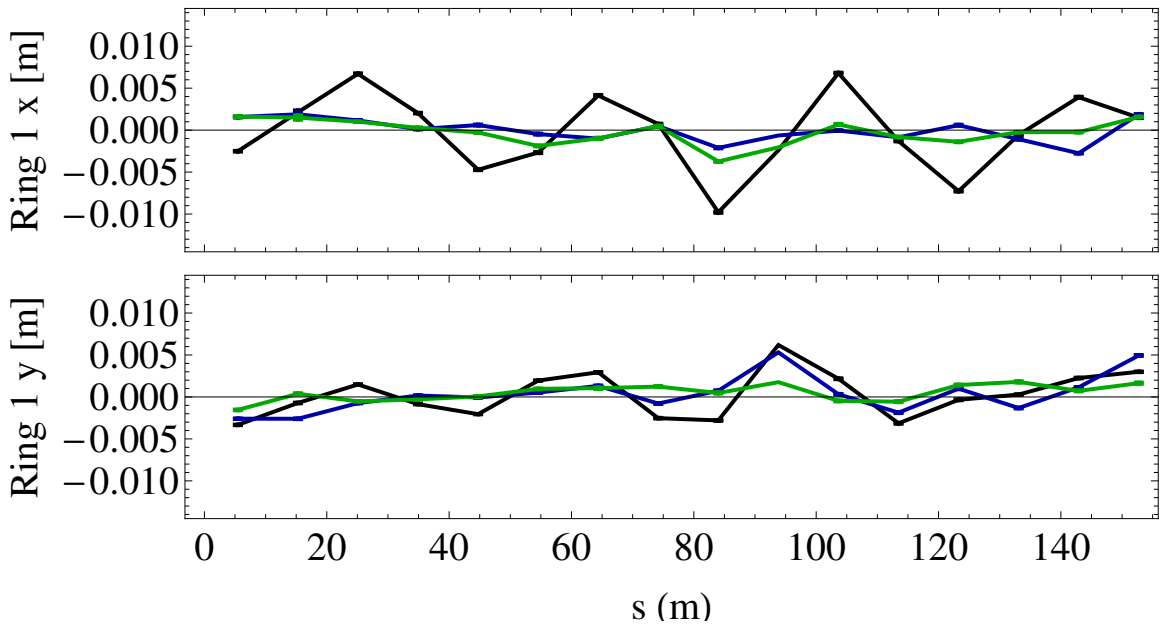


– measured (before move)

– measured (after move)

– expected (after moves)

Corrected orbit after QDE2 move

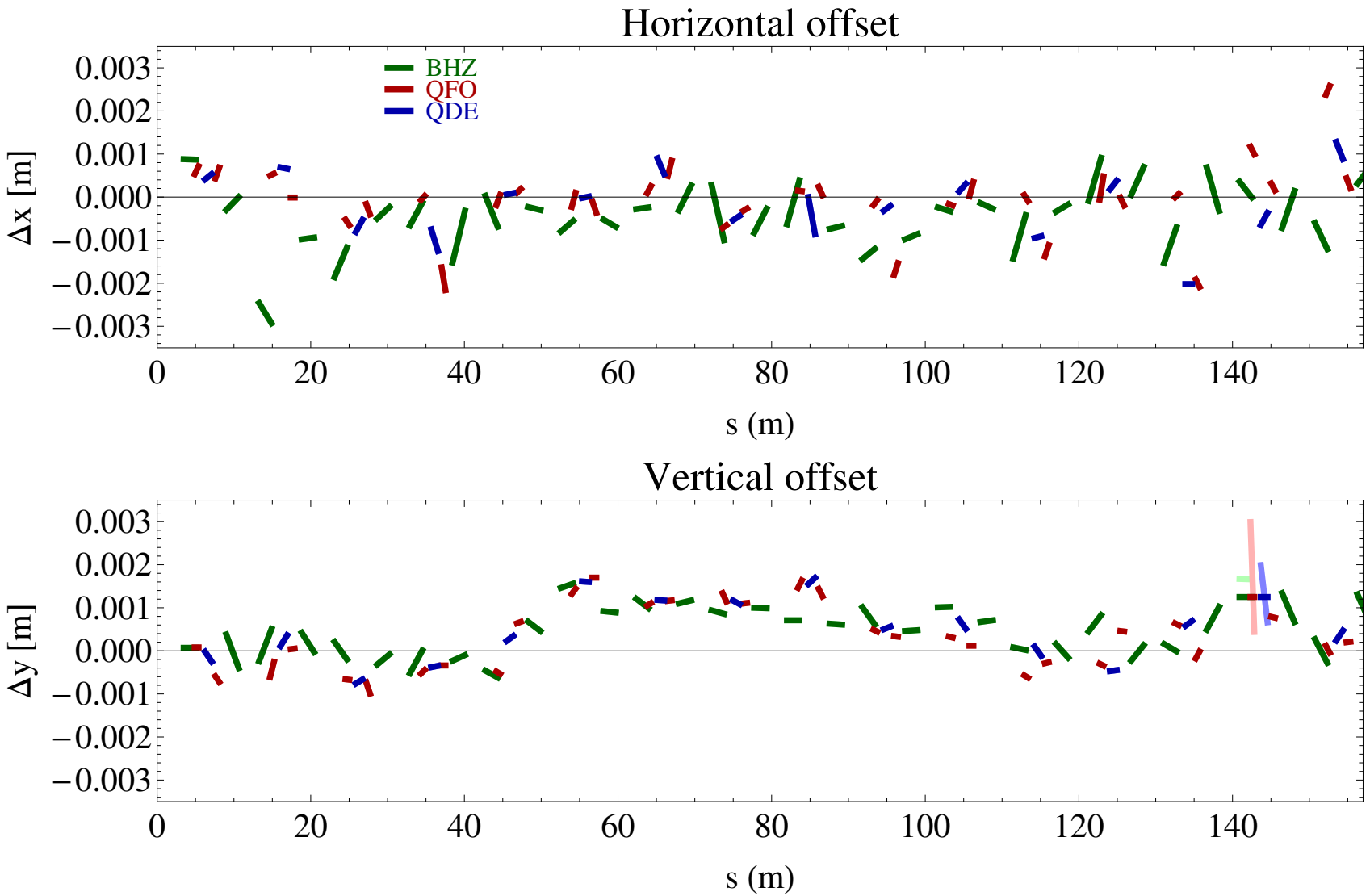


– measured (uncorrected)

– measured (old correctors)

– measured (new correctors)

Further realignment plans



Summary

- Large y orbit excursion after LS1 realignment caused radiation issues
- Immediate solution: one magnet was moved by 1 mm (reduced y orbit excursion by half)
- Remaining orbit distortion is well-controlled with orbit corrector magnets
- Further magnet moves will be made during technical stop to reduce x orbit excursion