

Ver.5 Optics Check with SAD

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Magnet Strength Check

NAME	Nominal	Ver5	NAME	Nominal	Ver5
QF1X	0.5366	0.5369	QM16FF	-0.6378	0.0000
QD2X	-0.4708	-0.4708	QM15FF	0.3251	0.3199
QF3X	0.3354	0.3354	QM14FF	-0.0738	-0.7581
QF4X	0.3395	0.3395	QM13FF	0.0937	0.4629
QD5X	-0.4592	-0.4606	QM12FF	0.3023	-0.1164
QF6X	0.5637	0.5635	QM11FF	0.0000	0.0800
QF7X	0.1887	0.1913	QD10BFF	-0.1450	-0.1450
QD8X	-0.2848	-0.2950	QD10AFF	-0.1450	-0.1450
QF9X	0.3967	0.3816	QF9BFF	0.1893	0.1893
QD10X	-0.6210	-0.5835	QF9AFF	0.1893	0.1893
QF11X	0.5117	0.5117	QD8FF	-0.3022	-0.3022
QD12X	-0.5117	-0.5117	QF7FF	0.2751	0.2751
QF13X	0.6841	0.6841	QD6FF	-0.3012	-0.3012
QD14X	-0.5077	-0.5077	QF5BFF	0.1880	0.1880
QF15X	0.6841	0.6841	QF5AFF	0.1880	0.1880
QD16X	-0.5117	-0.5117	QD4BFF	-0.1484	-0.1484
QF17X	0.5117	0.5117	QD4AFF	-0.1484	-0.1484
QD18X	-0.3430	-0.3430	QF3FF	0.2764	0.2764
QF19X	0.3276	0.3276	QD2BFF	-0.0994	-0.0994
QD20X	-0.1511	-0.1511	QD2AFF	-0.1449	-0.1449
QF21X	0.1507	0.2224	QF1FF	0.3709	0.3709
QS1X	0.0000	0.0000	QD0FF	-0.6820	-0.6820
QS2X	0.0000	0.0000	SF6FF	4.2804	4.2823
QK1X	0.0000	0.0000	SF5FF	-0.4025	-0.3954
QK2X	0.0000	0.0000	SD4FF	7.5400	7.4550
QK3X	0.0000	0.0000	SF1FF	-1.2950	-1.2890
QK4X	0.0000	0.0000	SD0FF	2.1832	2.1559

**The list was SAD definition.
(K1/2 or K2/2)**

*Nominal --- Nominal Optics presented
by T. Okugi at 9/14.*

*Ver.5 --- Ver5 Optics presented
by G. White at 9/21
(rematched to IP with QF21X and QMs)*

FF quadrupoles are same strength for both optics.

*EXT quads and matching quads and FF sextupoles are different setting
as G.White's presentation at 9/21.*

Beam Size Simulation for Optics Ver5

	σ_x (rms)	σ_x (core)	σ_y (rms)	σ_y (core)
w/o multipole errors no correction	8.64 μ m	8.47 μ m	35.3nm	34.7nm
with multipole errors before optimization	8.64 μ m	8.47 μ m	40.0nm	38.3nm
with multipole errors after 6pole optimization	8.64 μ m	8.47 μ m	34.9nm	34.4nm

Input beam parameters

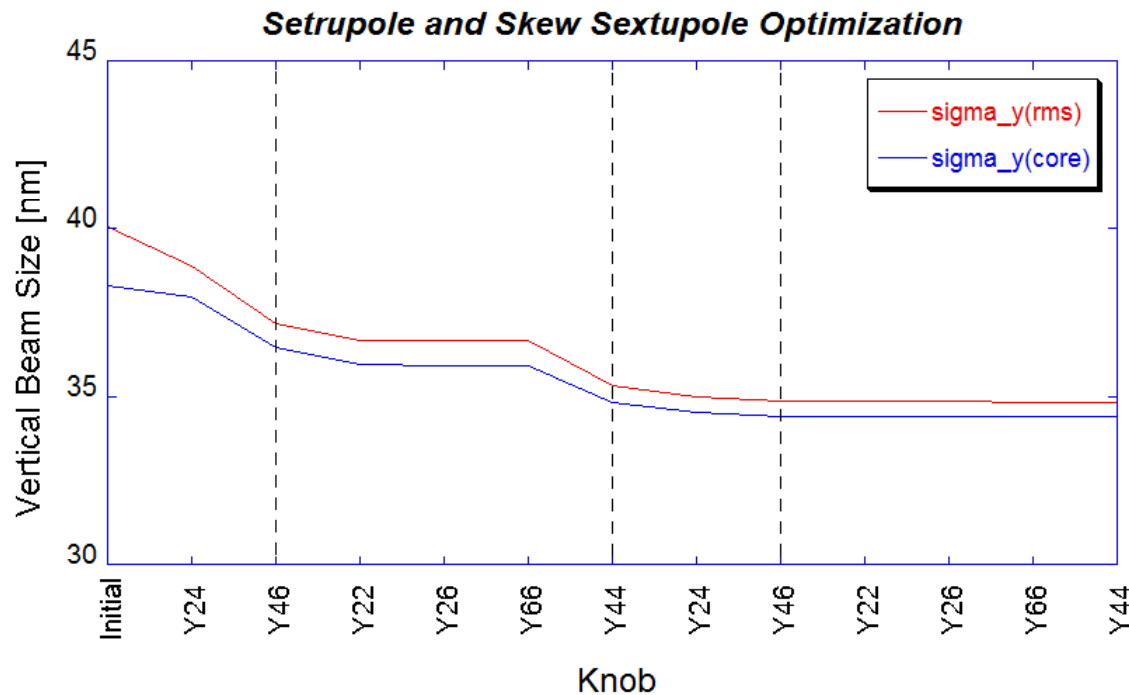
$$emitx = 2nm$$

$$emity = 12pm$$

$$\sigma p/p = 0.08\%$$

FF sextupole Strength (SAD definition; K2/2)

	Before optimization	After optimization
SF6FF	4.2823	4.2787
SF5FF	-0.3954	-0.4088
SD4FF	7.4550	7.6153
SF1FF	-1.2890	-1.2986
SD0FF	2.1559	2.2002
SK4FF	0.0000	0.0295
SK3FF	0.0000	0.0219
SK2FF	0.0000	0.1184
SK1FF	0.0000	-0.0046



Summary

Strengths of FF quadrupole magnets are same for both nominal optics and optics deck ver.5.

The vertical beam size can be squeezed to 34nm by applying the corrections of sextupole and skew sextupole strengths.

I also recommend to use the Ver.5 optics at the beginning of 2012 autumn run.