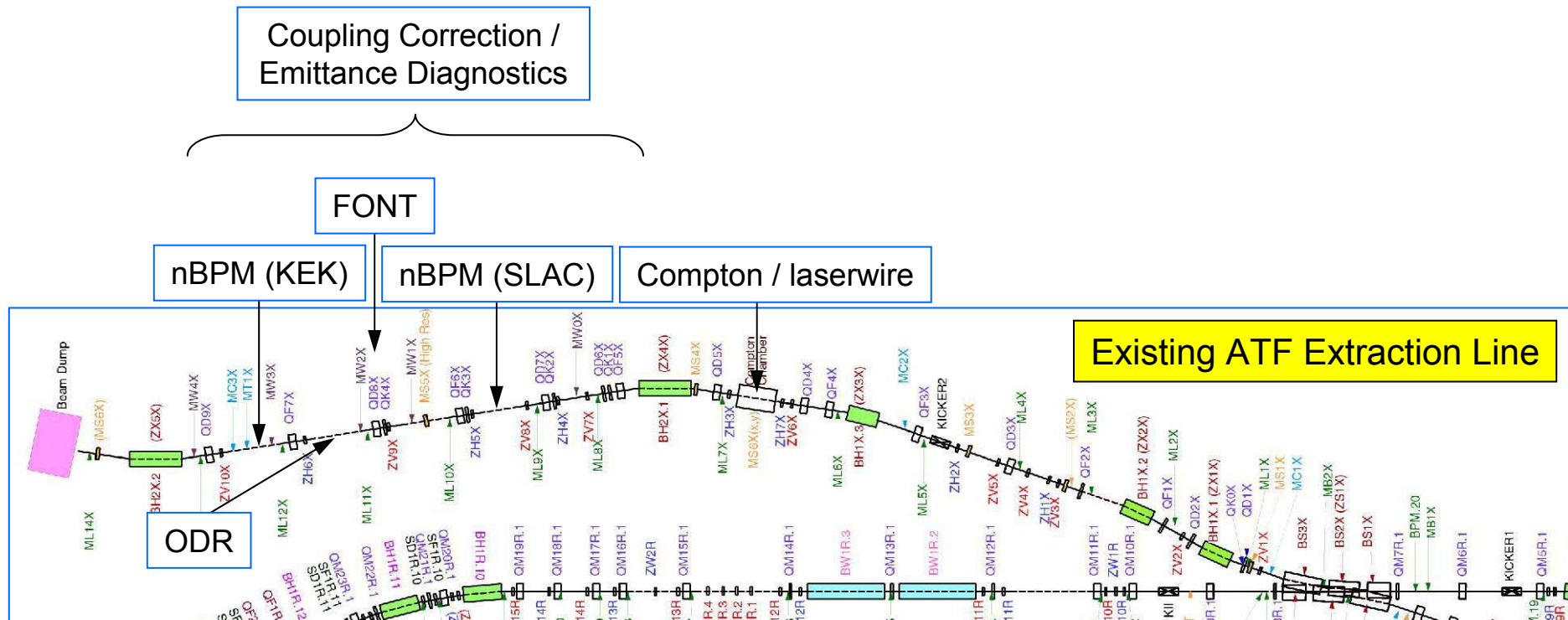
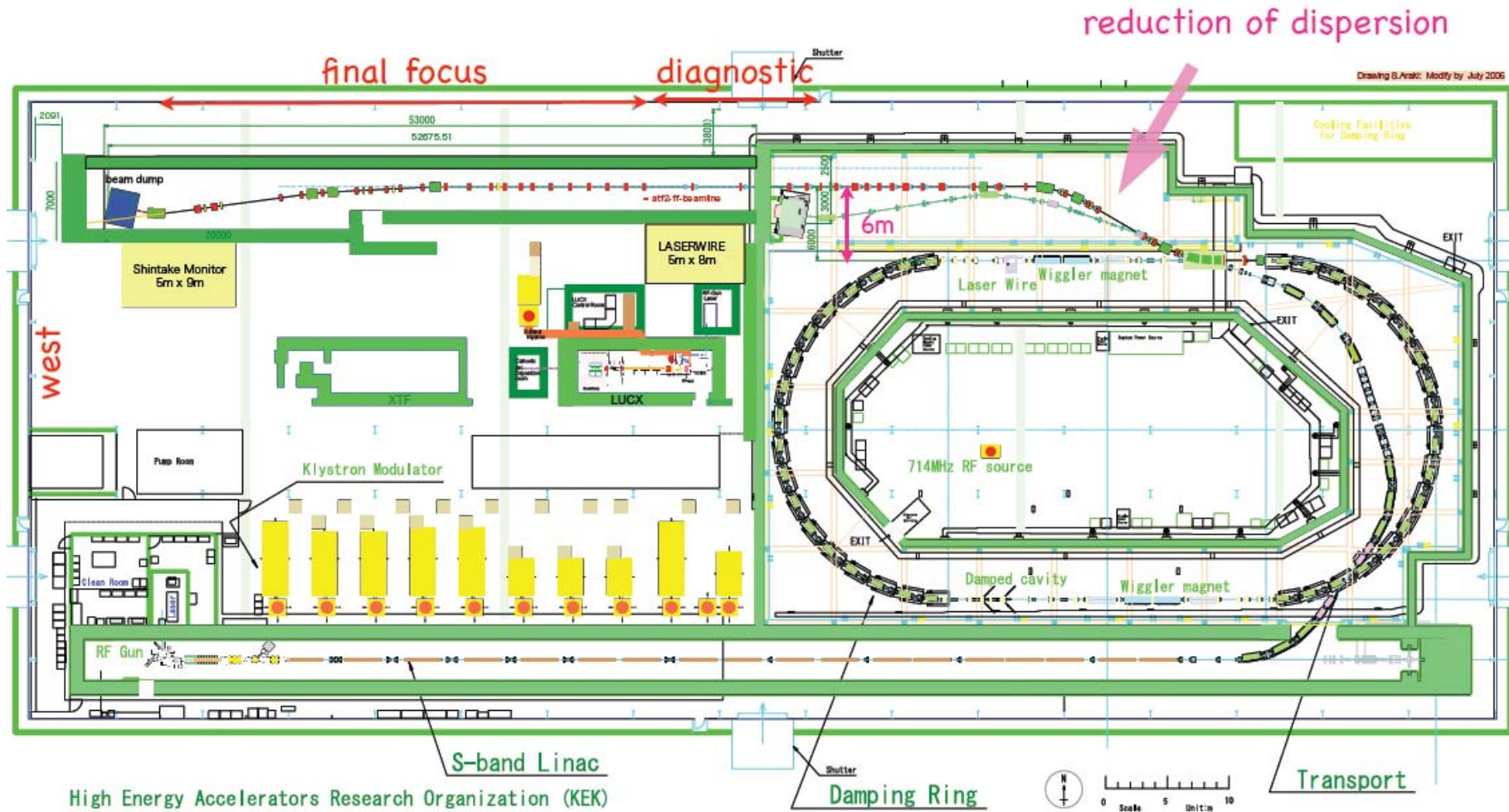




ATF2 Layout/Optics (v3.6)



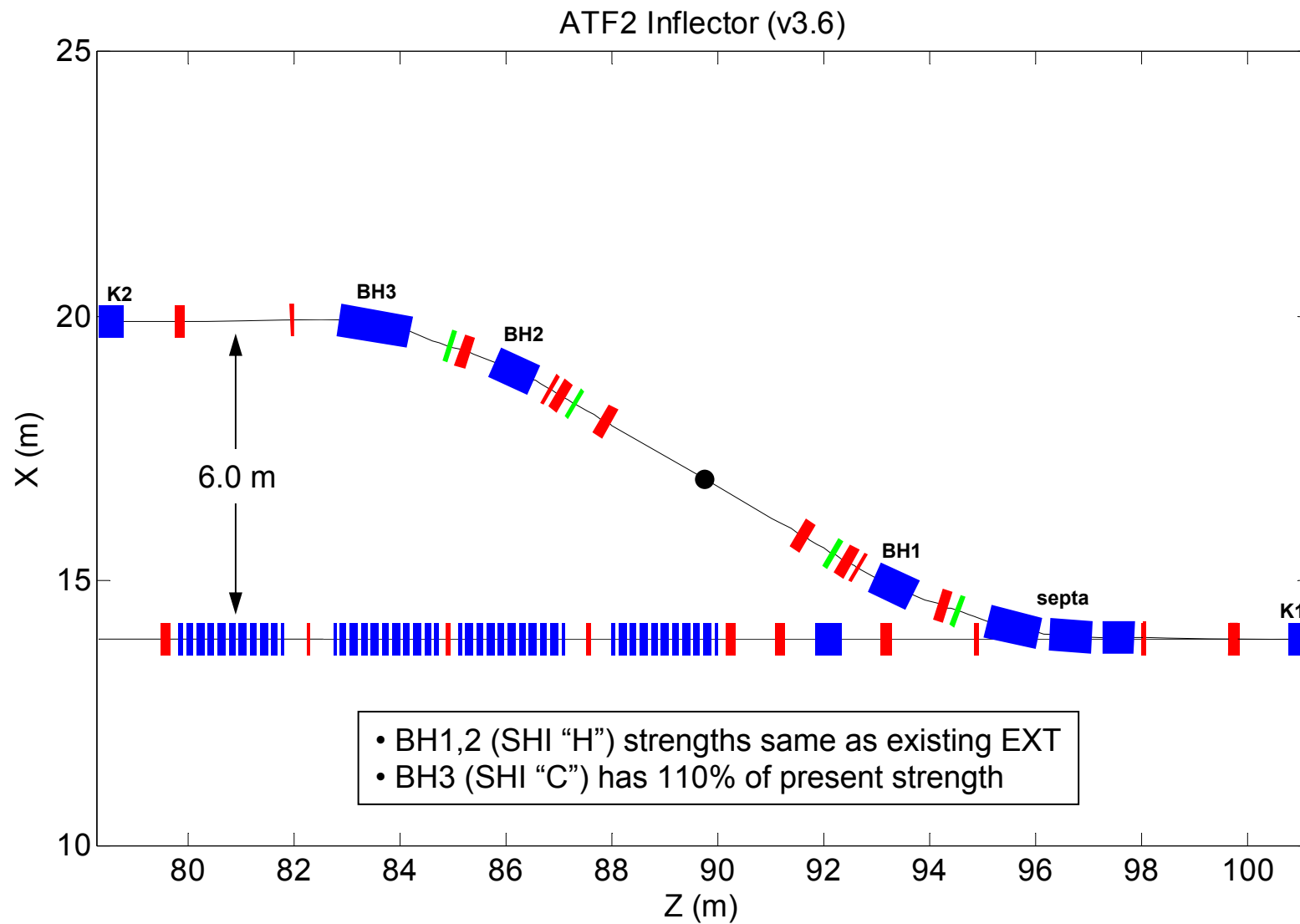


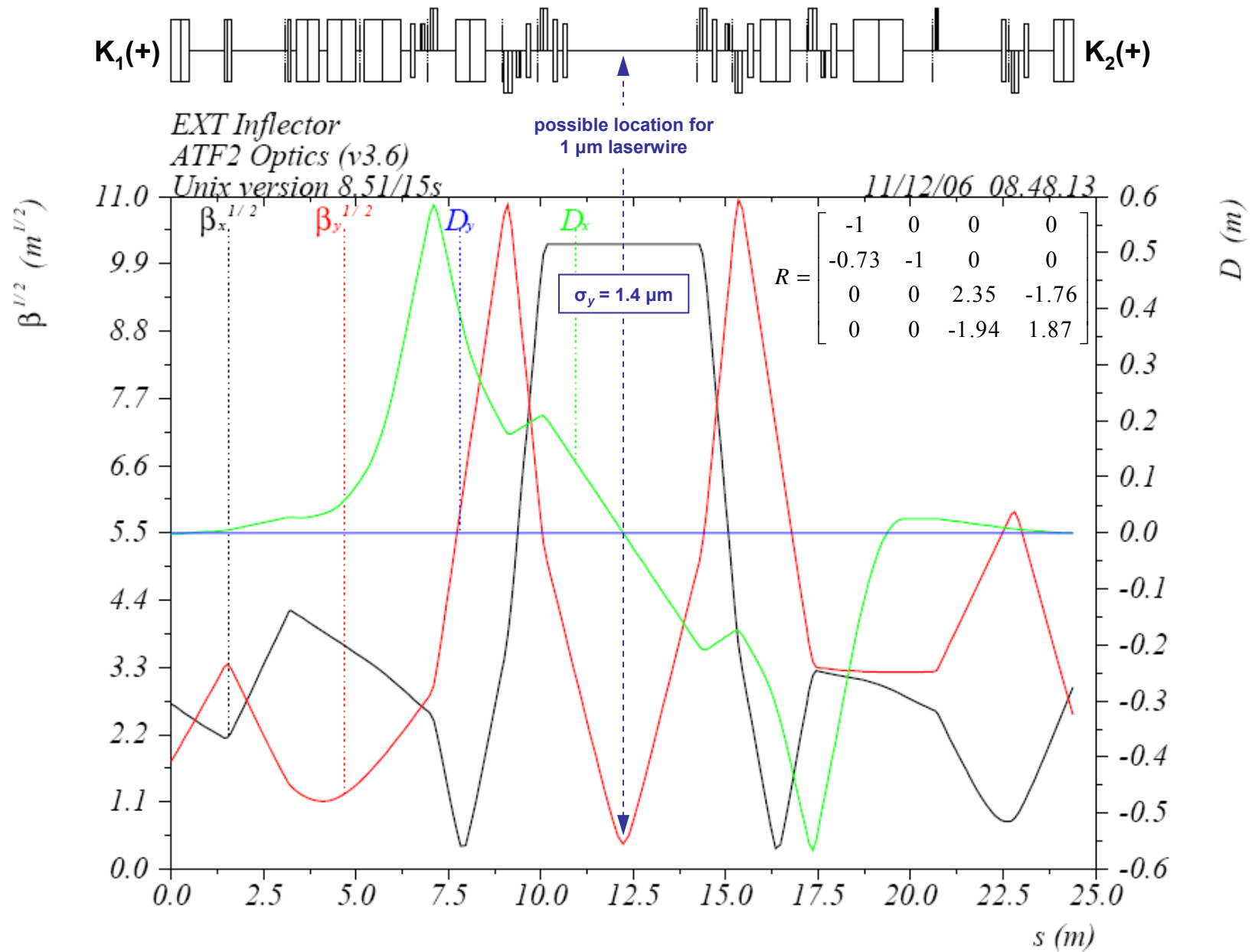
Version 3.6 Changes

- Andrei's latest FF optics with reduced U3224
- EXT skew quadrupoles for vertical dispersion correction
- octupoles will be removed
- Cherrill's latest designs for FF magnets (coming soon)
- and other things that come out of this meeting ...

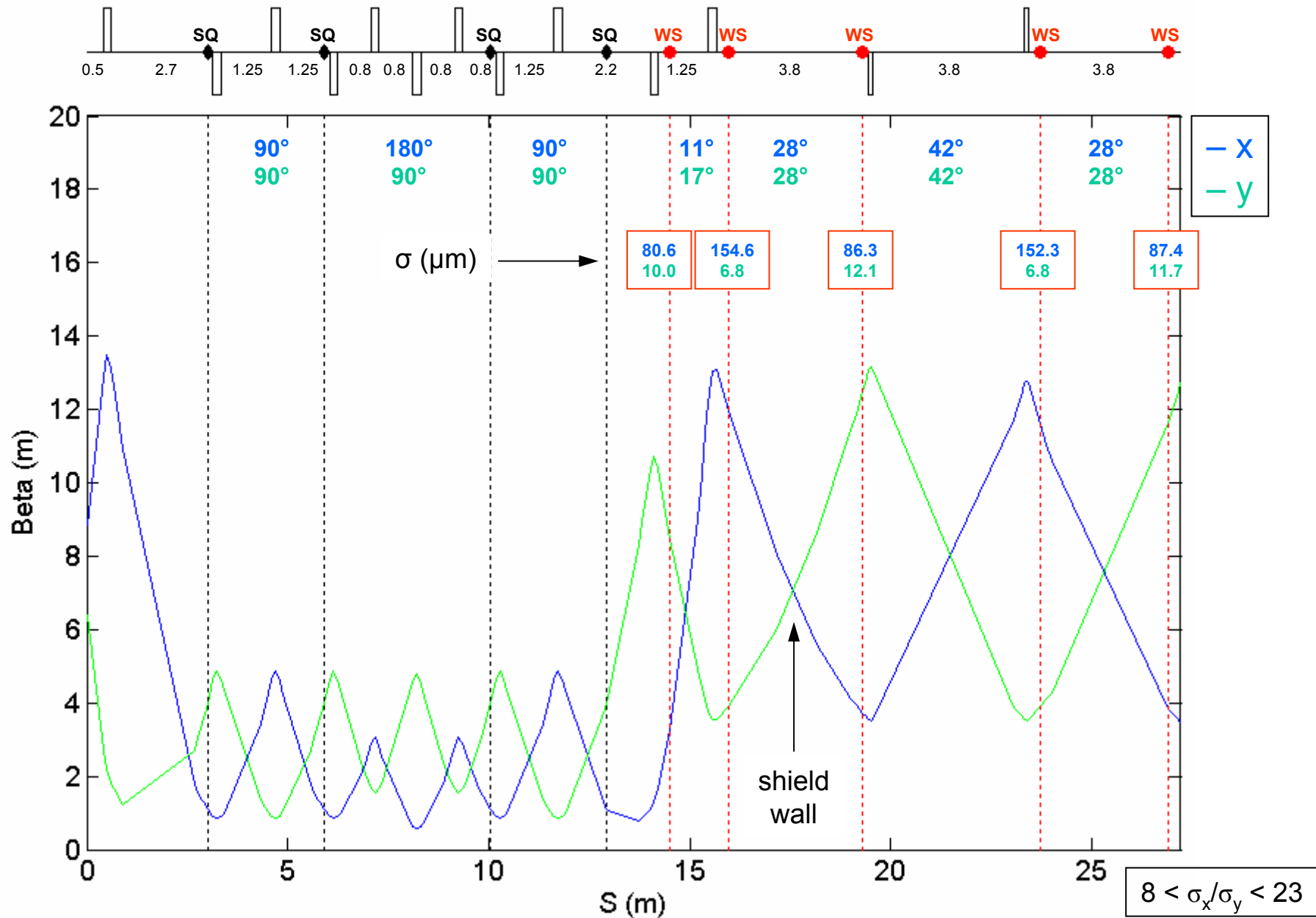
Tracking Results

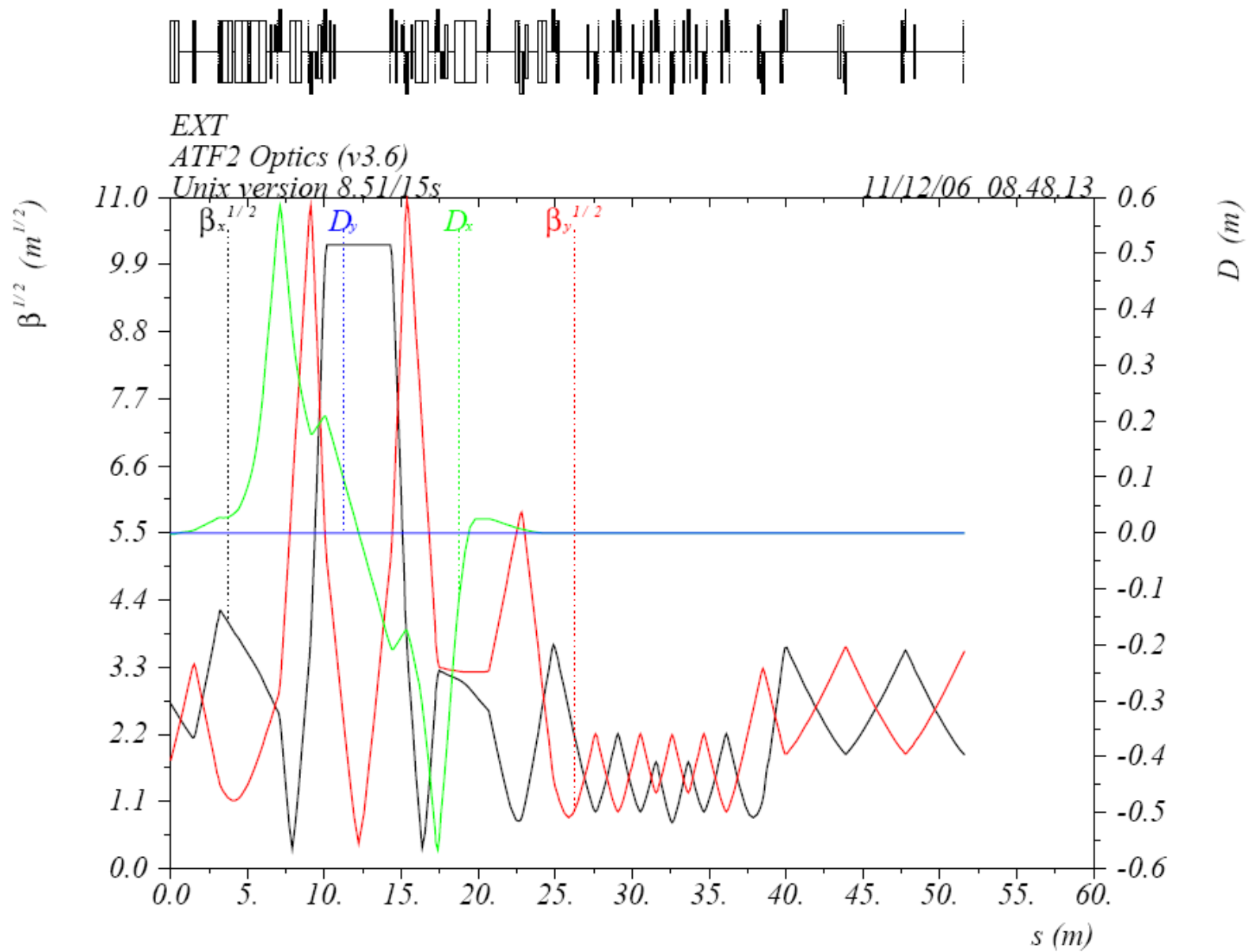
Program	σ_y^* (rms) nm	σ_y^* (sig) nm	$\gamma\varepsilon_y$ nm	$\Delta\gamma\varepsilon_y$ %
MAD	34.954	34.126	30.49878	1.7
ELEGANT	35.771	35.010	30.46264	1.5
TURTLE	37.122	35.536	31.78008	5.9
DIMAD	34.895	35.677	30.40376	1.3
LUCRETIA	35.913	35.717	30.63341	2.1
SAD				

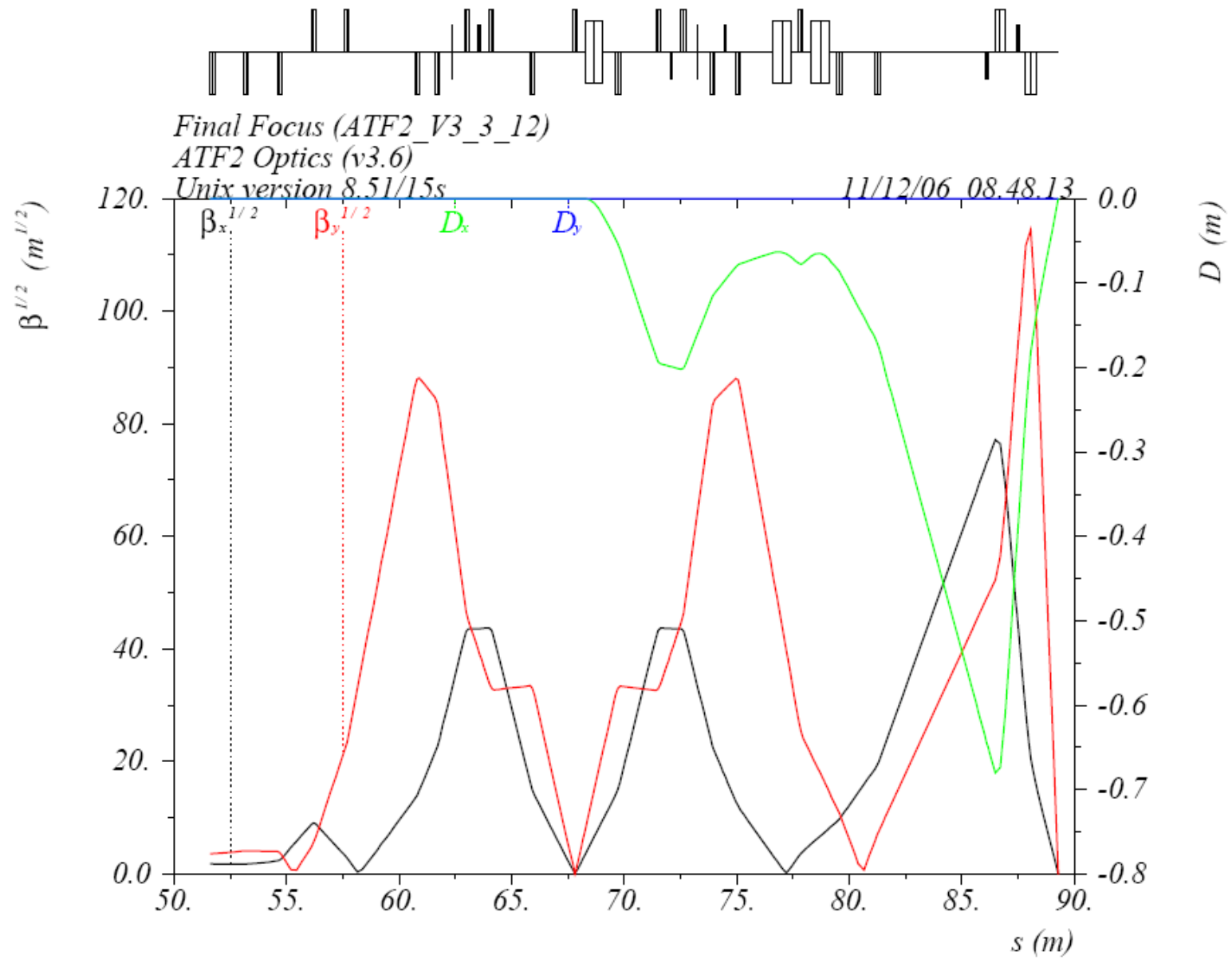


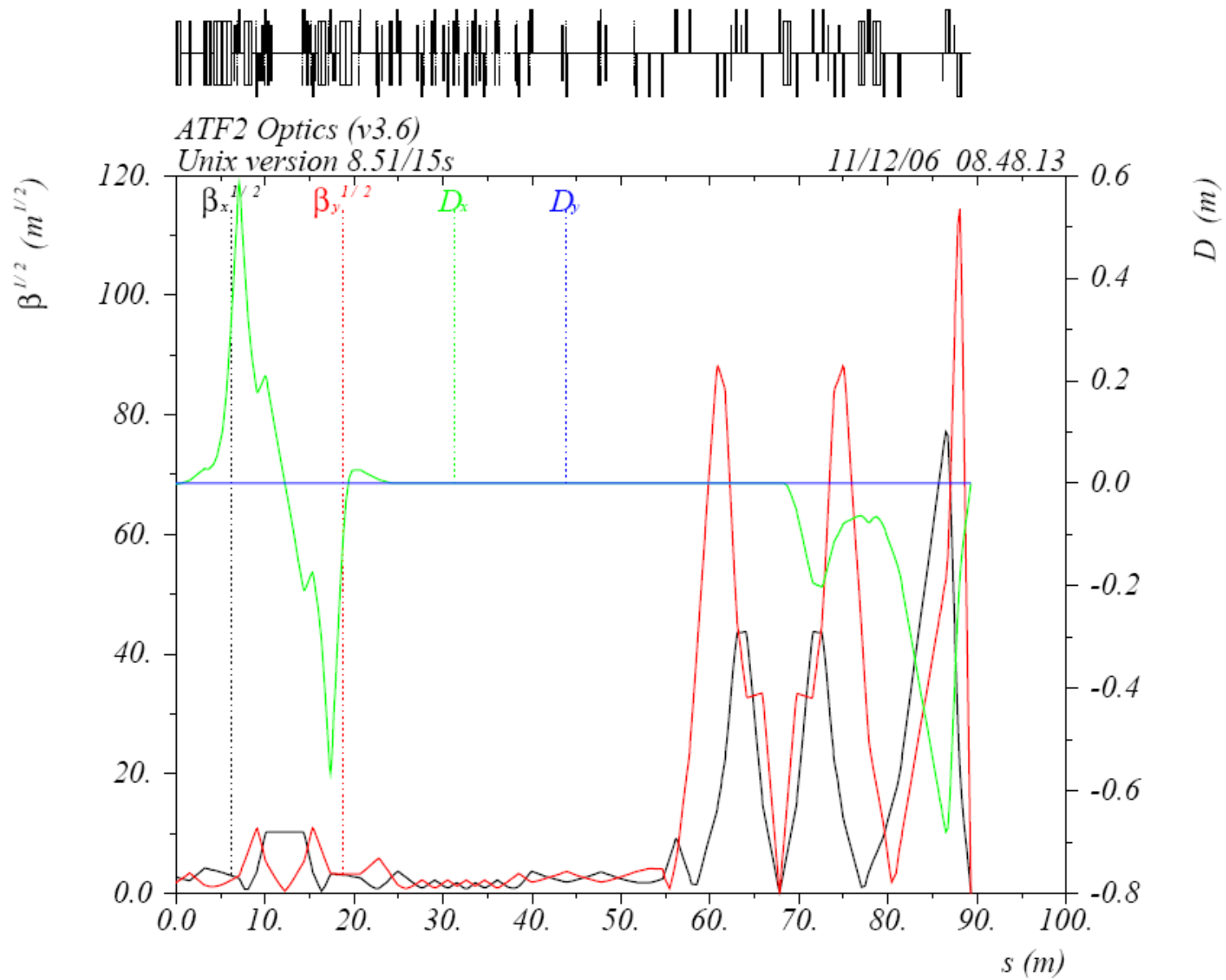


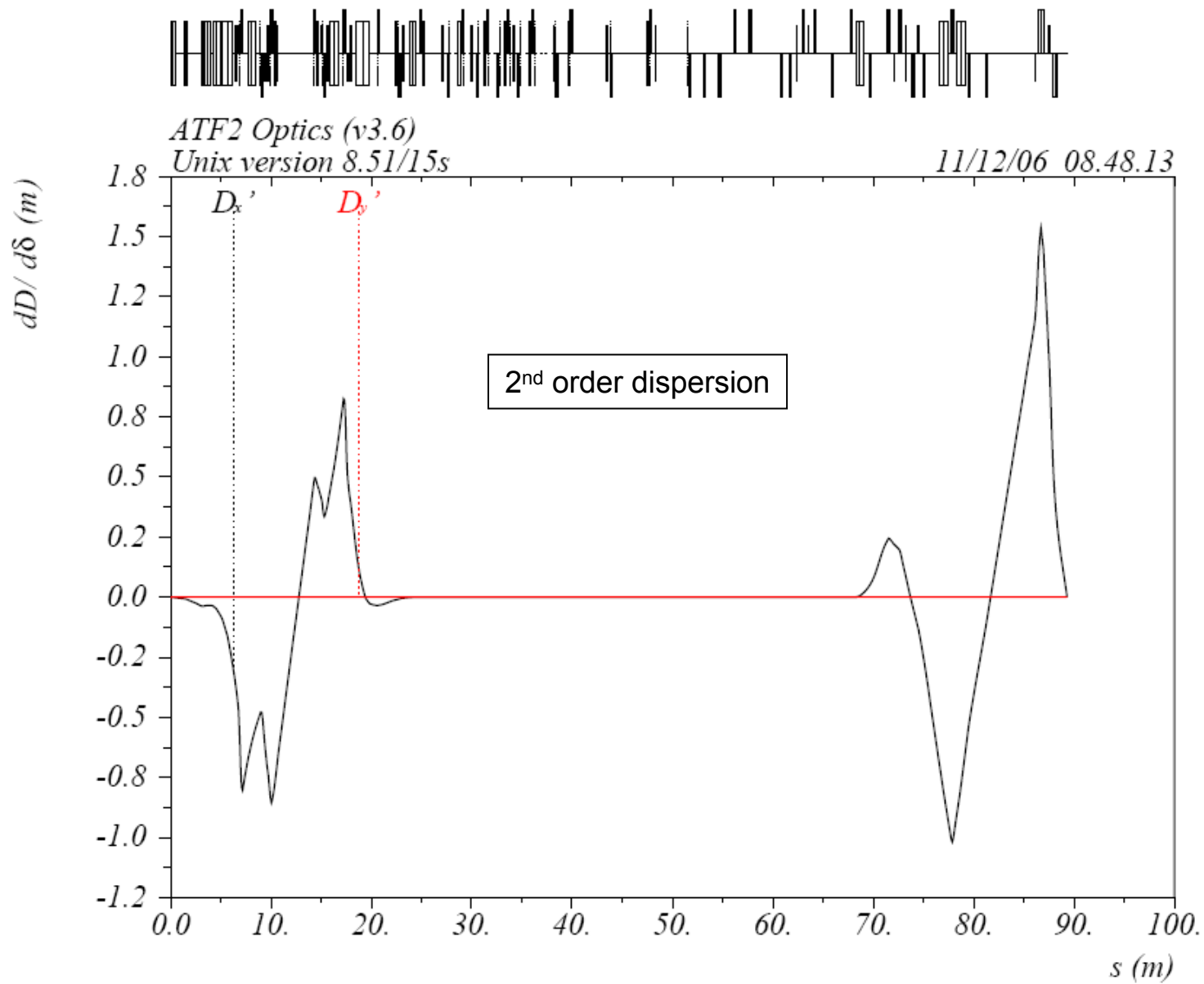
EXT Diagnostic Section (v3.6)

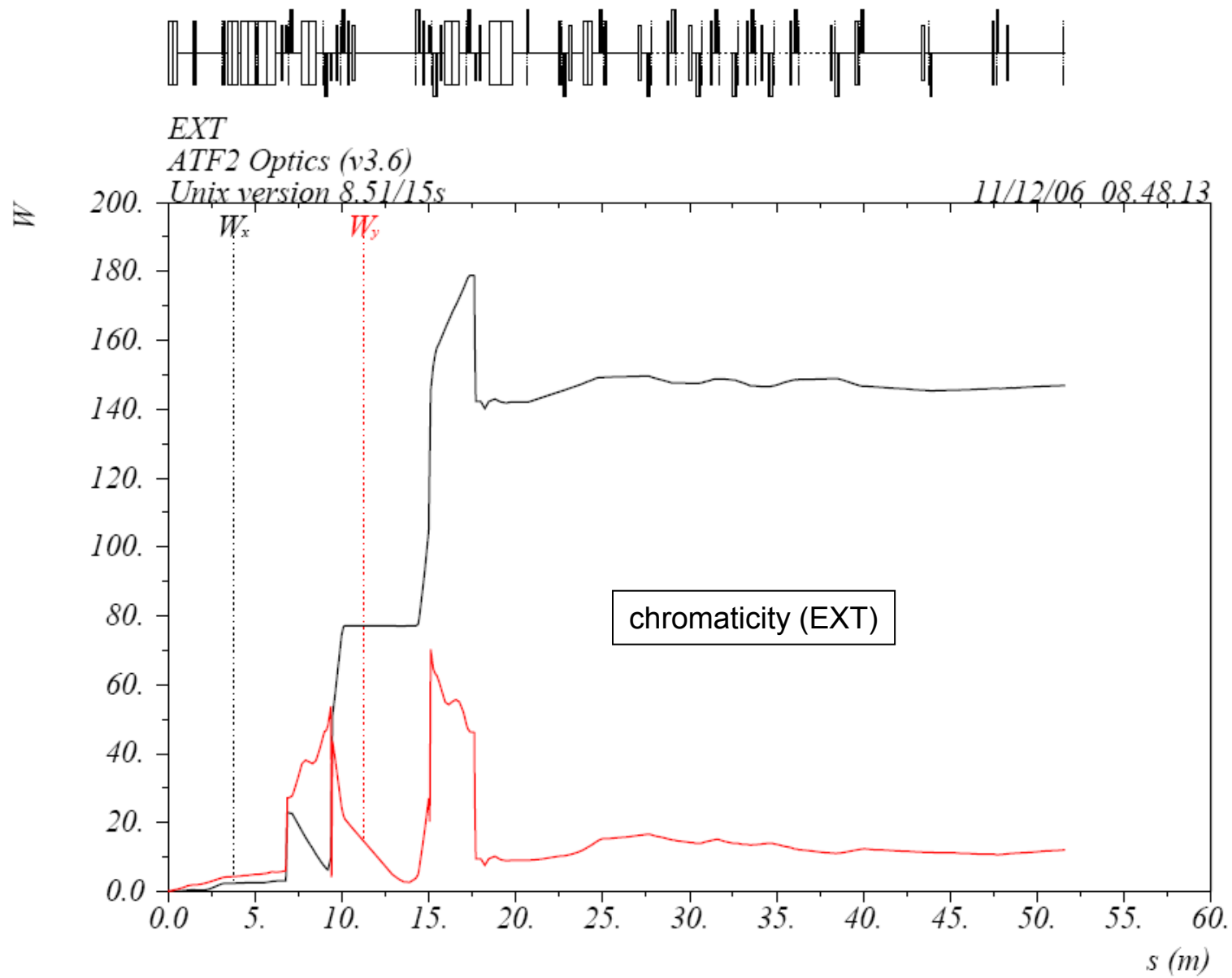






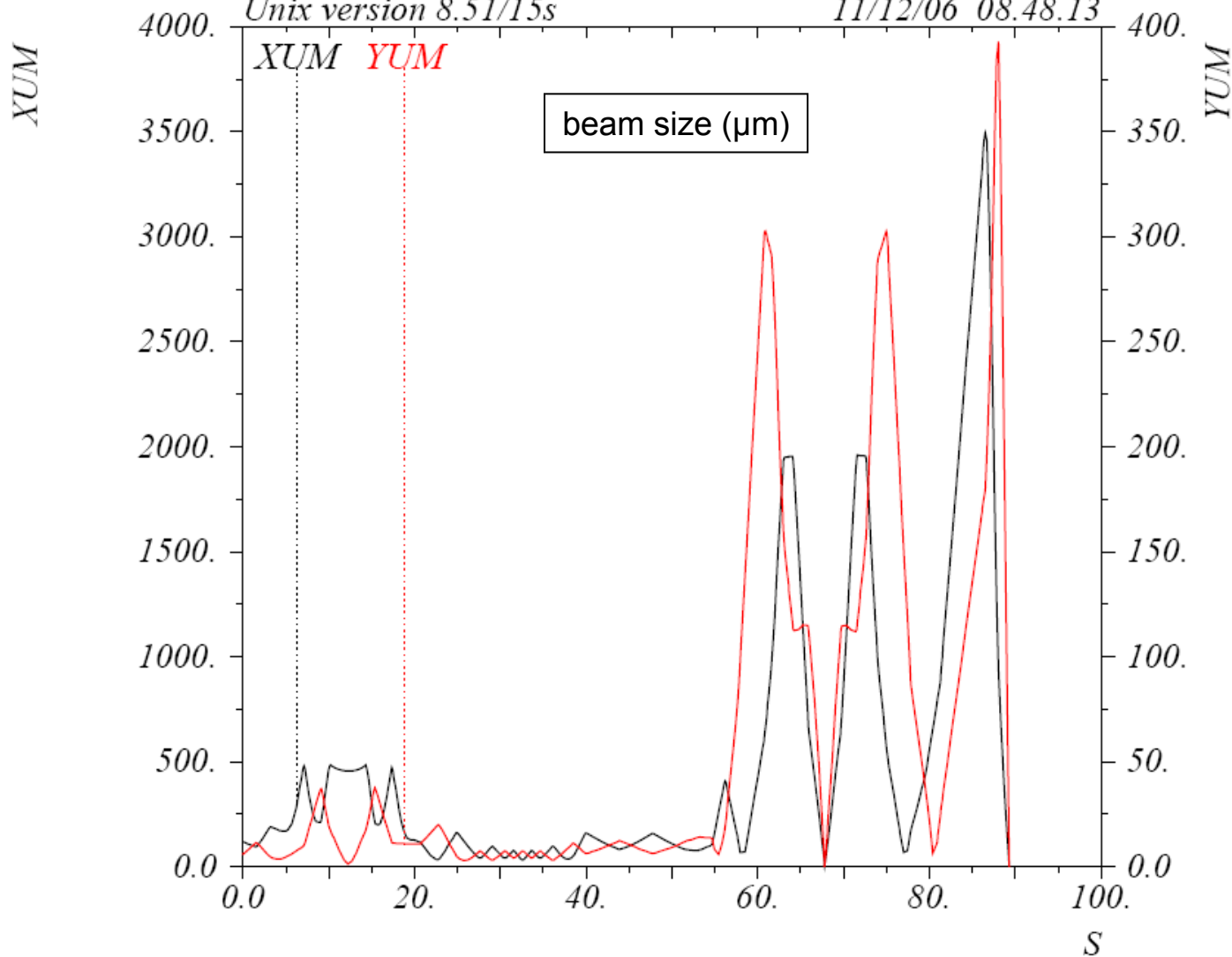






ATF2 Optics (v3.6)
Unix version 8.51/15s

11/12/06 08.48.13



Parameters

energy = 1.3 GeV

$\gamma\epsilon_x = 5 \times 10^{-6}$ m

$\epsilon_x = 2 \times 10^{-9}$ m

$\gamma\epsilon_y = 3 \times 10^{-8}$ m

$\epsilon_y = 1 \times 10^{-11}$ m

$\sigma_z = 8$ mm

$\sigma_\delta = 0.08$ %

$\beta_x^* = 4$ mm

$\beta_y^* = 0.1$ mm

$\sigma_x^* = 2.828$ μm

$\sigma_y^* = 34$ nm

TABLE 1: existing ATF EXT quadrupoles

power supply maximum currents from N. Terunuma email (April 22, 2005)

a note on names: the "quad name" column names the location in the beam line; the "magnet name" column names the physical magnet that presently resides at each location; the "power supply" column names the power supply whose cables come to that location

quad name	magnet name	magnet type	power supply	Imax p.s.	KLmax @ 1.3 GeV	notes
QD1X	QD1Xmag	Hitachi 2	QD1Xps	100	0.6657	
QD2X	QD2Xmag	Hitachi 2	QD2Xps	100	0.6657	
QF1X	QF1Xmag	Hitachi 2	QF1Xps	100	0.6657	
QK0X	QK0Xmag	ECUBE skew	QK0Xps	20	2.7673e-4	
QS1X	QS1Xmag	ECUBE skew	QS1Xps	20	2.7673e-4	
QF2X	QF2Xmag	Hitachi 1	QF2Xps	100	0.2989	
QD3X	QD3Xmag	Hitachi 5	QD3Xps	100	2.1050	
QF3X	QF3Xmag	Hitachi 5	QF3Xps	100	2.1050	
QF4X	QF4Xmag	Hitachi 5	QF4Xps	100	2.1050	
QS2X	QS2Xmag	ECUBE skew	QS2Xps	20	2.7673e-4	
QD4X	QD4Xmag	Hitachi 5	QD4Xps	200	2.1050	use Imax = 100 amps
QD5X	QD5Xmag	Hitachi 5	QD5Xps	100	2.1050	
BH4X
QF5X	QF5Xmag	Hitachi 5	QF5Xps	100	2.1050	
QK1X	QK1Xmag	IDX skew	QK1Xps	5	2.5363e-2	
QD6X	QD6Xmag	Tokin 3393	QD6Xps	100	0.3021	
QK2X	QK2Xmag	IDX skew	QK2Xps	5	2.5363e-2	
QD7X	QD7Xmag	Hitachi 5	QD7Xps	100	2.1050	
QK3X	QK3Xmag	IDX skew	QK3Xps	5	2.5363e-2	
QF6X	QF6Xmag	Hitachi 5	QF6Xps	100	2.1050	
QK4X	QK4Xmag	IDX skew	QK4Xps	5	2.5363e-2	
QD8X	QD8Xmag	Hitachi 4	QD8Xps	200	2.0650	
QF7X	QF7Xmag	Hitachi 4	QF7Xps	100	1.0488	
QD9X	QD9Xmag	Hitachi 4	-----	---	2.0650	in series with QD8X

magnetic measurements data file	Imax
-----	-----
ATF\$MAG:MAG_KI_Q_HITACHI_1.FOR	140.2
ATF\$MAG:MAG_KI_Q_HITACHI_2.FOR	100.2
ATF\$MAG:MAG_KI_Q_HITACHI_4.FOR	200.4
ATF\$MAG:MAG_KI_Q_HITACHI_5.FOR	100.6
ATF\$MAG:MAG_KI_Q_TOKIN_3393.FOR	139.0
ATF\$MAG:MAG_KI_Q_IDX_SKEW.FOR	20.0
ATF\$MAG:MAG_KI_Q_ECUBE_SKEW	20.0

TABLE 2: ATF2 EXT quadrupoles and sextupoles ("version 3.6")

name	magnet name	magnet type	power supply	Imax p.s.	KLmax	KL	NOTES
SF1X		1.38S3.00		10	24.5	7.1038	FFTB sextupole
QF1X	QD3Xmag	Hitachi 5	QD3Xps	100	2.1050	1.0702	
QS1X					4.6122e-3	0.0	new magnet?
QD2X	QF3Xmag	Hitachi 5	QF3Xps	100	2.1050	-0.9410	
SD2X		2.13S3.00		10	6.5	-6.2996	FFTB sextupole
QF3X	QF4Xmag	Hitachi 5	QF4Xps	100	2.1050	0.6696	
QF4X	QD4Xmag	Hitachi 5	QD4Xps	100	2.1050	0.6840	
SD3X		2.13S3.00		10	6.5	6.2996	FFTB sextupole
QD5X	QD5Xmag	Hitachi 5	QD5Xps	100	2.1050	-0.9276	
QS2X					4.6122e-3	0.0	new magnet?
QF6X	QF5Xmag	Hitachi 5	QF5Xps	100	2.1050	1.1264	
SF4X		1.38S3.00		10	24.5	-7.4491	FFTB sextupole
QF7X	QD1Xmag	Hitachi 2	QD1Xps	100	0.6657	0.3751	
QD8X	QD7Xmag	Hitachi 5	QD7Xps	100	2.1050	-0.5948	
QF9X	QF6Xmag	Hitachi 5	QF6Xps	100	2.1050	0.7347	
QK1X	QD6Xmag	Tokin 3393	QD6Xps	40	0.1237	0.0	convert old QD6X?
QD10X		IHEP		100	2.1	-1.0237	
QF11X		IHEP		100	2.1	1.0237	
QK2X	QK2Xmag	IDX skew	QK2Xps	5	2.5363e-2	0.0	
QD12X		IHEP		100	2.1	-1.0237	
QF13X	QD8Xmag	Hitachi 4	QD8Xps	200	2.0650	1.3683	
QD14X	QF7Xmag	Hitachi 4	QF7Xps	100	1.0488	-1.0152	
QF15X	QD9Xmag	Hitachi 4			2.0650	1.3683	in series with QF13X
QK3X	QK3Xmag	IDX skew	QK3Xps	5	2.5363e-2	0.0	
QD16X		IHEP		100	2.1	-1.0237	
QF17X		IHEP		100	2.1	1.0237	
QK4X	QK4Xmag	IDX skew	QK4Xps	5	2.5363e-2	0.0	
QD18X		IHEP		100	2.1	-0.6833	
QF19X		IHEP		100	2.1	0.6552	
QD20X	QD2Xmag	Hitachi 2	QD2Xps	100	0.6657	-0.2989	
QF21X	QF1Xmag	Hitachi 2	QF1Xps	100	0.6657	0.2989	

note: QF2X (Hitachi 1) and one IHEP quadrupole are left over

Version 3.6 Issues

- BH3 (Sumitomo Heavy Industries type “C”) ... can it run at 110% of it's present strength?
- need to get another FFTB “1.38S3.00” sextupole from SLAC for EXT
- cavity BPMs on EXT quads with no movers (QD18X, QF19X, QD20X, QF21X)?
- kicker cables (kickers are 8.2 m / 35 ns further apart)
- compact laserwire package design (laserwire chamber + wire scanner + BPM(s))
- where to put: KEK BPM triplet, nanoBPM, FONT4, ODR, ... ?
- MAD deck for FF is still sketchy ... need to put in BPMs, movers, etc.
- need to do more misalignment/correction and performance simulations (including realistic wire scanner resolutions, extraction channel errors, ...)

Version 3.6 Deck Issues

- differences between MAD and SAD
- “split bend disease”
- SURVEY (layout) differences ... which coordinates to use for initial magnet alignment? (differences at the few hundred micrometer level ...)
- earth’s curvature following or laser straight? (vertical difference is same order as alignment tolerances)
- differences in tracking results (probably not significant)
- different decks (or LINE definitions) for different purposes? (i.e. a special SURVEY deck, a special tracking deck, ...)
- other issues?

ATF2 Inflector (v3.6)

