Goals at this meeting

Major issues to be presented and discussed;

1. Review commissioning status
   - hardware and software
   - background
2. Update the strategy and milestones
   - detailed plan in this summer
3. Long Term Plan in 2010 -

T. Tauchi,

8th ATF2 Project Meeting, 8-11 June 2009

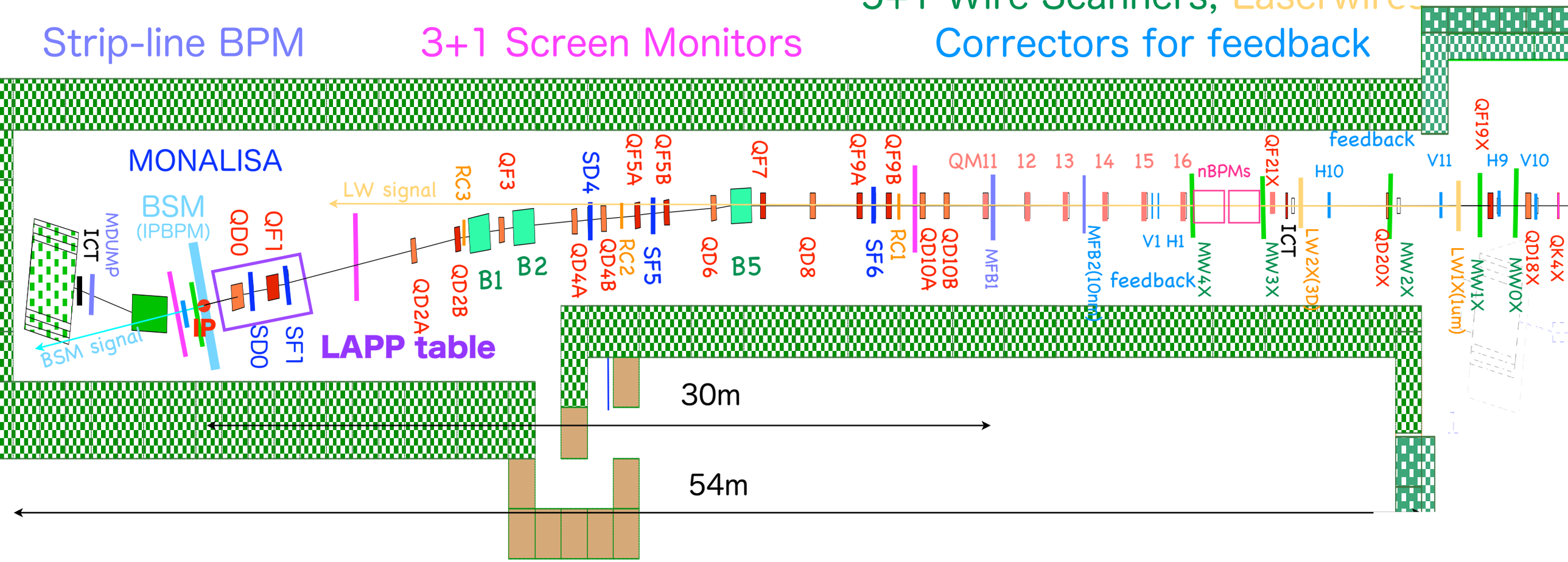
Hardware System at ATF2

22 **Q**uadrupoles, 5 **S**extupoles, 3 **B**ends in downstream of QM16
(IHEP, China) (SLAC) (SLAC, IHEP)

All Q- and S-magnets have cavity-type beam position monitors(QBPM, 100nm).
(PAL,KNU, Korea, and SLAC, RHUL for electronics)

5+1 Wire Scanners, Laserwire

Strip-line BPM 3+1 Screen Monitors Correctors for feedback

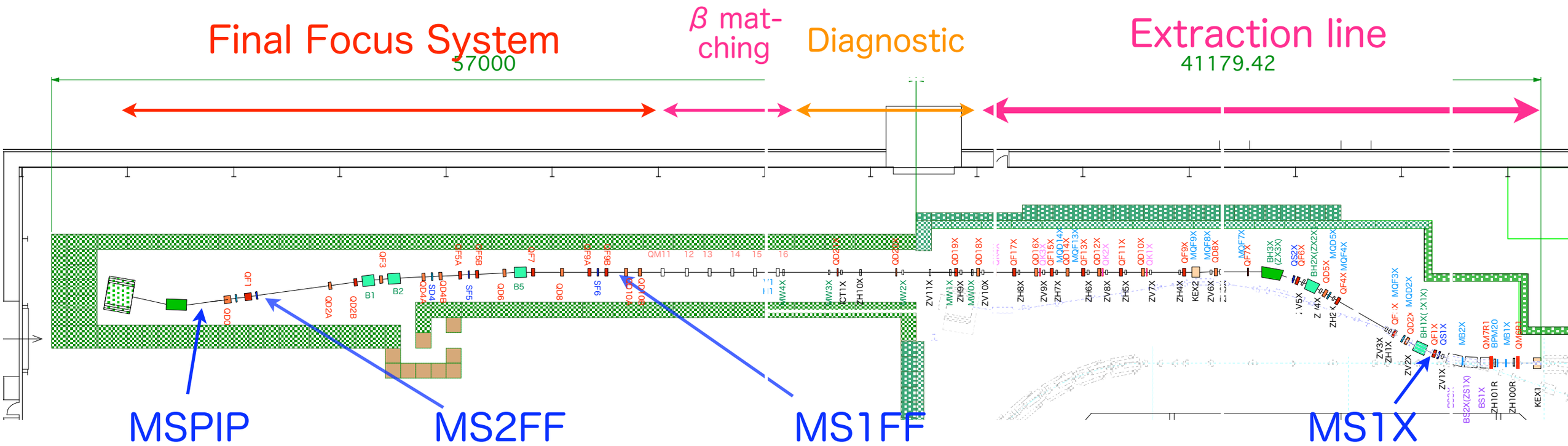


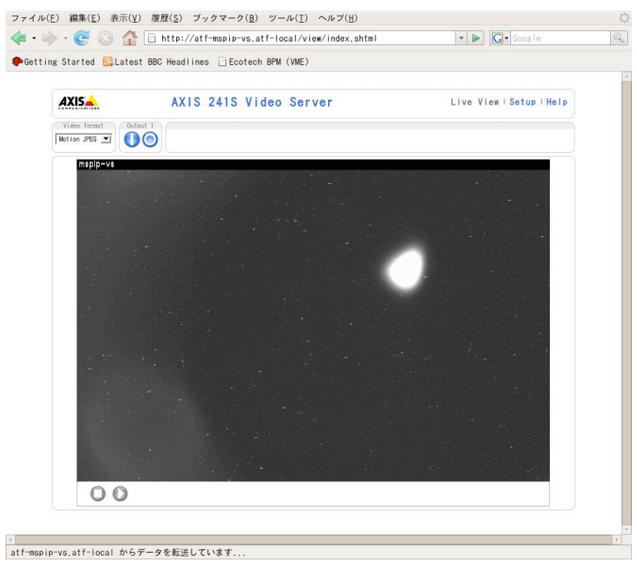
Shintake Monitor (beam size monitor, BSM with laser interferometer):Tokyo univ.
MONALISA (nanometer alignment monitor with laser interferometer):Oxford univ.
Laserwire (beam size monitor with laser beam for 1 μm beam size, 3 axies):RHUL
IP intra-train feedback system with latency of less than 150ns (FONT):Oxford univ.
Magnet movers for Beam Based Alignment (BBA):SLAC
High Available Power Supply (HA-PS) system for magnets:SLAC

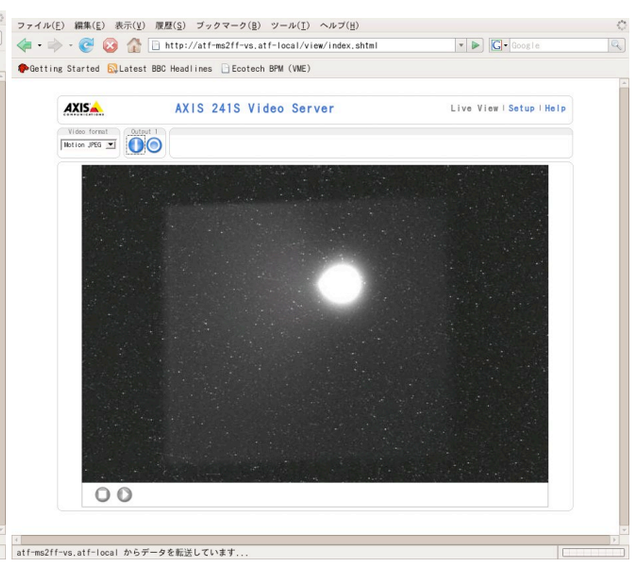
Component	Sub-component	Number	Comments	Status	Present	New	2007	plan in
Magnet	Quadrupole	28	with QD0,QF1	production	27	1	1	0
	Sextupole	5	4 with 50mm aperture and 2 with 32mm aperture	design	0	5	5	0
	Octupole	0			0	0	0	0
	Bend	3	FF-bends =3	production	0	3	3	0
	H. Steering	4	horizontal with 5A bipolar PS	1 added in v3.7	4	0	0	0
	V. Steering	2	vertical with 5A bipolar PS		2	0	0	0
	Skew Q	2	QK2X, QK3X	v3.7 optics	0	2	0	2
	Cable of ext.kicker	2	re-location of two kickers is alternative solution		0	2	0	2
Magnet Support	Movers	27	20Q-magnets, QD0,QF1 and 5 sextupoles	SLAC	27	0	0	0
	Base (Qs)	23	for each magnet except for the FD support	production	0	23	24	-1
	Bends	3	support system (3 bases and 3 interface plates)	design ?	0	3	3	0
	FD support	1	stable tables for QD0,QF1,SD0,SF1	CERN/LAPP	1	0	0	0
Power Supply	HA system	38	8(ExtQ), 6(MatQ), 5(Sext), 0(Oct), 16(FFQ), 3(B) ; 6 bipolar for QM11FF - QM16FF.	production		38	38	0
	Bipolar PS	2	bipolar and 20A for QK1X, QK2X	v3.7 optics		2	0	2
Vacuum	Beam pipe (m)	93.154	ATF extraction line at present and ATF2 beam line (50.613m)	production	0	93.154	46.577	46.58
BPM	Q-BPM for Q & Sext.	33	QD10-12X,16-17X,QD18-21X, IHEP-Qs in FF	production	39	-6	0	-6
	Q-BPM (s-band)	4	with larger diameter (40mm) ,final doublet system	design	0	4	0	4
	stripline	14	for commissioning and at extraction line	production	14	0	0	0
	IP-BPM	3	2nm resolution for position jitter at IP (	production/prototype	0	3	2	1
Wire scanner	Metal wire	5	exsit at the extraction line - relocation	existing	5	0	0	0
	Laserwire	5	upgrade of the metal wire scanners	R&D	0	5	0	1
IP - BSM	Shintake monitor	1	upgrade of the FFTB monitor, 532nm laser: 35-350nm	upgrade/ new design	1	0	0	0
	BSM-support	1	rigid and independent support	design	0	1	1	0
	Urakawa monitor	1	laser cavity type	R&D	0	1	0	0
Fast orbit correction	Feedforward	1	from DR to extraction line	R&D, design	0	1	1	0
	Feedback	1	intra-train fast feedback based on digital circuit	R&D	0	1	1	0
Pulse to pulse feedback	V and H correctors	4	orbit correction at the extraction line	proposed	0	4	0	4
	1um BPMs	4	orbit correction at the extraction line	proposed	0	4	0	4
Commissioning tools	Screen monitor	4		KEK	4	0	0	0
	Carbon wire scanner	1	beam size monitor at IP : up to 1um	SLAC	1	0	0	0
	Honda monitor	1	beam size monitor at IP : 350nm - 1um	proposed	0	1	0	1
	PLIC loss monitor	1	fiber with PMT readout	proposed	0	1	0	1
ICT	beam loss	2	beam current monitor		1	1	0	1
Beam dump	ATF2 Beam dump	1	design is the same as the ATF one		0	1	1	0

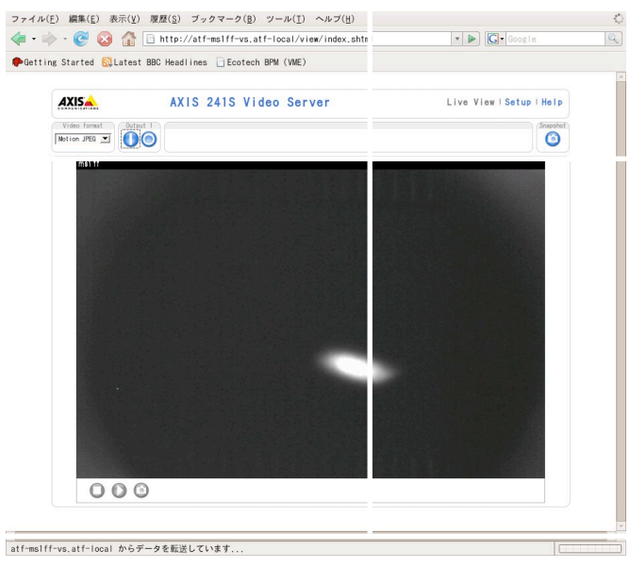
ATF2 Commissioning

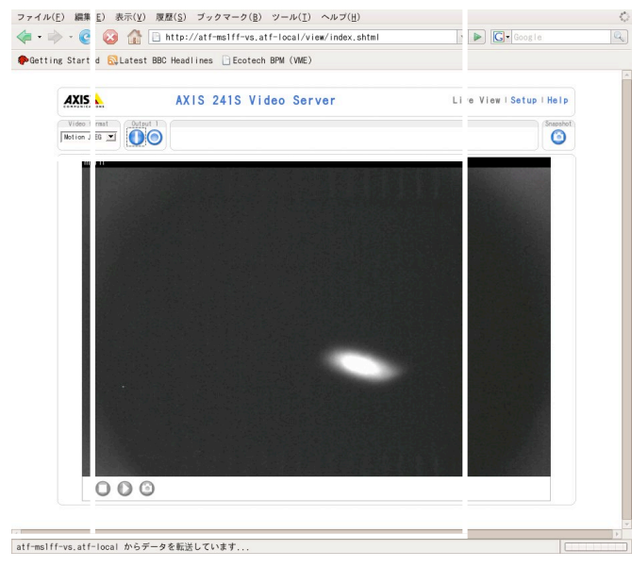
First commissioning by screen monitors and raw signals of BPMs



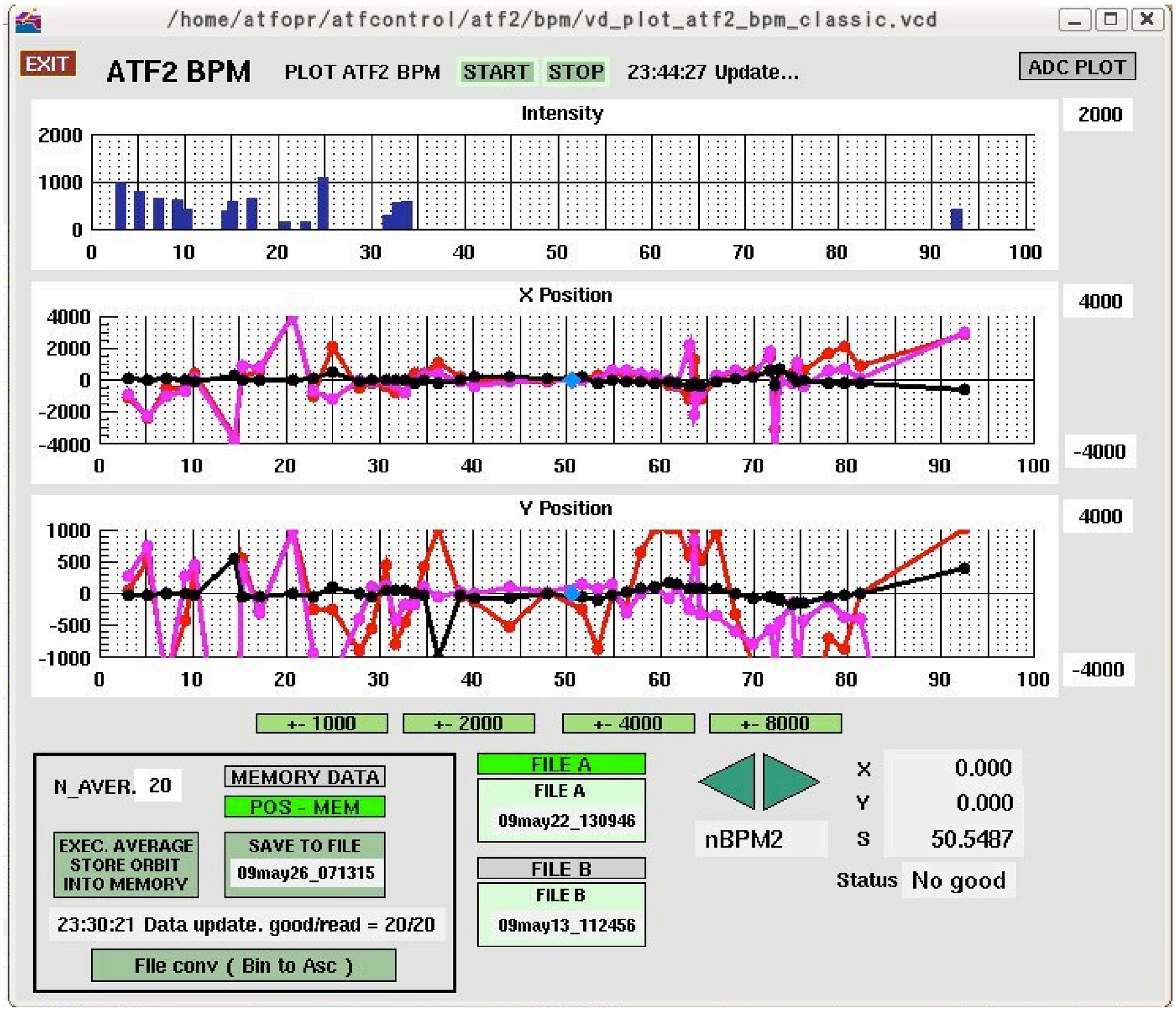








Almost all BPMs have been calibrated and provide positions.



Nominal parameter at ATF2

IP Parameter	Values	present
Beam energy	1.3GeV	-
Emittance in x	2 nm	done
Emittance in y	12 pm	close
Beta function in x	4 mm	8cm
Beta function in y	0.1mm	1cm
beam size in x	2.8 μm	not yet
beam size in y	35 nm	not yet

Key issues

1. Beam stability at LINAC and DR
   - improvement of cooling water system
     i.e. precise temperature control
   - upgrade of DR-BPM electronics
     all in this October
2. Reliable diagnostic tools
   - calibrated and reproducible/stable devices
     i.e. BPMs, wire scanners, screen monitors,
     OTRs and IP-BSM (Shintake monitor)
3. Softwares : ATF operation and flight simulator
   - integration of sub-system controls/monitors

Hardware to be commissioned

1. Carbon wire scanner with 5μm at the post IP

   note : 45 degree scanner with 10μm tungsten wires have been fully commissioned

   - vertical scanner with three 5m carbon wires

     one horizontal and two +/- 1.3 degree wires

2. OTR at the beginning of extraction line

3. Stripline BPMs with short and large aperture

   note : long and small aperture ones have been well calibrated.

4. S-band BPMs

   - to be confirmed at this meeting

5. Shintake monitor

   note : laser wire mode has been fully commissioned

   - Interference mode

   - IPBPM

“ATF2” site works in this summer

1. Monalisa
   - Vibration measurement at IP
2. Straightness monitor
   - installation
3. Laserwire
   - installation/commissioning the laser system
4. Shintake monitor
   - new screen, laser tuning (seed laser)
   - UK laser transport line
5. Alignment at ATF2 beam line
6. HLS system
   - a collaborator from SLAC

ATF beam operation schedule

10 2009

Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

11 2009

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

12 2009

Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

1 2010

Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

50% for ATF2 as a general rule

ATF2 internal milestones, Dec.08

	2009										2010								
	dec	jan	feb	mar	apr	may		oct	nov	dec	jan	feb	mar	apr	may		oct	nov	dec
BSM Laser Wire mode commissioned																			
First test of fast kicker																			
Observe several micron beam size																			
BSM 8º (0.25-1.5um) commissioned																			
Observe sub micron beam size																			
BSM 2º mode (1-6um) commissioned																			
Achieve ε_y=24pm beam in DR																			
BSM 30º (70-400nm) commissioned																			
Extract and preserve of ε_y=24pm																			
First observation of ILC-scaled σ_y=75nm																			
Achievement of ε_y < 12pm in DR																			
Repeat observation of 75nm beam																			
Extract & preserve ε_y=12pm beam																			
BSM 174º (20-100nm) commissioned																			
First observation of design 37nm beam																			
Fast kicker system fully commissioned																			
Monalisa installed on beamline																			
Reliable observation of 37nm beam																			
Achieve 2nm resolution of IP BPM																			
Evaluate IR position stability to nm level																			
Commissioning of Monalisa																			
Commissioning of FONT feedback																			
Observe of nm stability of IP position																			
Initial tests of squeezed -function																			

VERY TENTATIVE
to be updated

Session Organization

	8th June Monday	9th June Tuesday	10th June Wednesday	11th June Thursday
9:00 12:00		IPBSM Optics modeling Beam dia. at EXT	Beam size tuning Comm, Plan Strategy and Update plans	Summary of project meeting Brief summaries by conveners
13:30 Introduction -start at 14:00 Comm. status 16:00		Align. & stability Feedback system	Future plan Joint w. ILC-BDS	TB/SGC Proposals (4) R&Ds closed session Conclusion

16:30, ATF Daily operation meeting

18:30- RunEnd Party

Goals at this meeting

1. Update of “monthly” milestones by 2010

- with experiences so far and the goal of 37nm by end of 2010

2. Detailed plan for sub-systems

- establishment of beam tuning procedure with free run as well
- IPBSM (Shintake monitor) commissioning of interference mode
- Cabon-wire scanner and OTR
- Stripline BPMs, S-band BPMs : calibration
- IPBPM, tilt monitor, Monalisa, straightness monitor, LW and FONT etc.

3. Detailed schedule by end of December, 2009

- IP Beam size tuning with carbon wire scanner (100nm/step) : 1um
- IP Beam size tuning with Shintake monitor : 2-174 deg. mode < 100nm