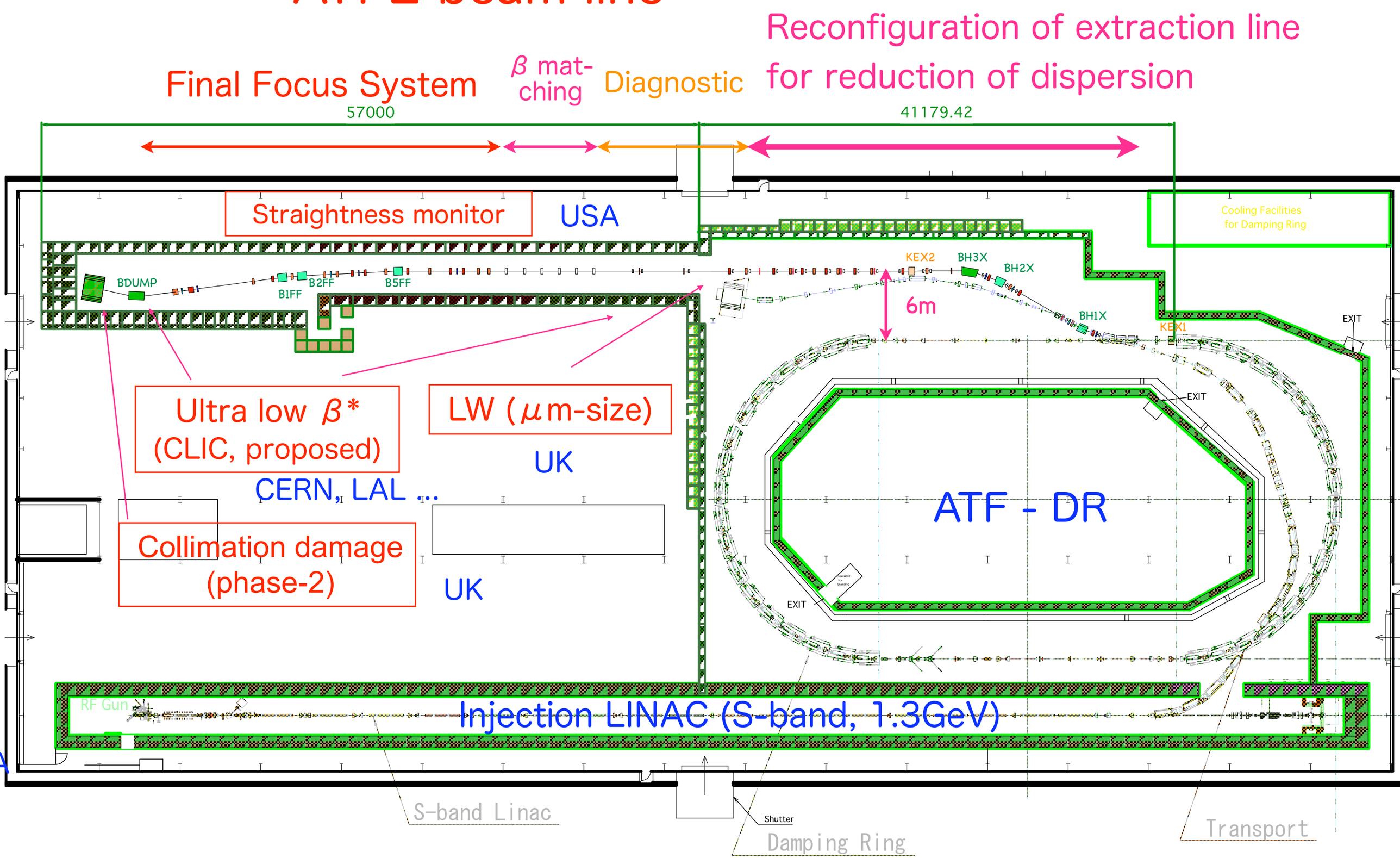
ATF2 Commissioning Plan

T. Tauchi,

ATF-ICB, 18 November 2008

ATF2 beam line



2007/Mar/02 N.Terunuma, KE

April 2008

Organization of Commissioning Team

Goal of the team is to achieve the target beam size, i.e. σy=37nm, by 2010. Also, the team will develop beam tuning tools and find the mostly needed ones for minimizing beam size.

Team leader : Toshiyuki Okugi (KEK)

Mailing list : atf2-commissioning@ilcphys.kek.jp since April 2008
home page : http://ilcphys.kek.jp/mail/atf2-commissioning/

Monthly meetings with Webex

Coordination with other R&D tasks will be taken care by the System/Group Coordinators (SGCs) in the ATF international collaboration.

In the meantime, T.Okugi and K.Kubo will collaborate to plan a tentative schedule for three years with gathering information from the R&D tasks, since K.Kubo is Machine Study Schedule Coordinator in the SGCs.

Commissioning Team Member (beam tuning)

Institute	Leader	member	contribution on site	Study Item
KEK		Shigeru Kuroda	full time	
		Kiyoshi Kubo	full time	
		Toshiyuki Okugi	full time	
Tokyo univ.	Yoshio Kamiya	Not yet decided	2 people/year	Shintake monitor upgrade
Tohoku univ.	Tomoyuki Sanuki	Tomoyuki Sanuki	0.14 FET/year	
		Taiten Okamoto	0.56 FET/year	
IHEP	Jie Gao	Sha Bai	6 months/year	
LAL	Philip Bambade	Philip Bambade	12 months from 2008.10	Emittance tuning studies (DR to extraction line)
		Yves Renier	11 months from 2008.10	
		Filimon Gournaris	8 months from 2008.11	
LAPP	Andrea Jeremie	Andrea Jeremie	2 weeks in 2008.10	
		Benoit Bolzon	8 months from 2008.9	
Daresbury	Deepa Angal-Kalinin	Deepa Angal-Kalinin	2 months/year	
		James Jones	2 months/year	
		Tony Scarfe	2-3 months for 08-09	
Oxford univ.	Philip Burrows	Javier Resta Lopez		FONT
		Tony Hartin		
		Students		

SLAC listed in the scheduling table

Strategy of ATF2 commissioning

Nov.-Dec. 2008

Radiation Inspection,12/10

Fast Kicker Study

The “fast kicker study” will use the special setting.

ATF2 Start

Jan. 2009～

Beam line commissioning

Reduction of radiation loss

Injection stabilization

DR study

(fast ion, DR emittance ⋯)

Hardware study at the extraction line

(FONT, Laser Wire ⋯)

Extraction line tuning and study

(dispersion, coupling correction , emittance growth at extraction⋯)

Device Commissioning for ATF2

(cavity BPM, Mover, Guarder, Magnet PS)

ATF2 final focus line study

(beam size tuning, stabilization ⋯)

Organization of Software Projects

Expression of interests (EoIs) for the projects has been called, 24 June, 2008.

We adopt the two software environments, i.e.

(1) in framework of V-system (ATF control system) and

(2) the flight simulation

Many softwares based on the V-system have been developed and used at ATF and the flight simulator is very useful to develop the softwares for colleagues especially outside of KEK.

Overall coordinator : Shigeru Kuroda (KEK)

Organizing task groups with priorities and task leaders

ATF2 Software Task List

ATF2 Software Tasks , Sep. 2008

Beam Tuning Direct	Beam Tunung Direct		
Project Title	Contributing Institutes	Priority	Leader
Coupling Mea.&Corr. in EXT	KEK,SLAC,LAL,CI	VH	C.Rimbault
Dispersion Mea.&Corr. In EXT	KEK,SLAC,CI	VH	J.Jones
EXT Beta-Matching	SLAC, KEK,CI,LAL	VH	K.Kubo
EXT Orbit Corr./FB	SLAC,KEK,LAL,CI, JAI	VH	Y.Renier
FFS Orbit Corr./FB	SLAC,KEK,LAL,CI, JAI	VH	A.Scarfe
Beam Line Modeling Tools	SLAC,CI	M	S.Molloy
IP FB(Pulse-Pulse)	LAL, JAI	H+L	Y.Renier
FB Integration	SLAC, JAI	H	J.R.Lopez
IP Waist&Beta adjustment	LAL(IHEP),CI	H	S.Bai
Non-Mover-Based BBA(EXT)	KEK,LAPP	H	T.Okugi
Mover-Based BBA(FFS)	SLAC,KEK,LAPP	H	J.Nelson
Final IP Spot-Size Tuning	SLAC,KEK,LAL,Tokyo,CERN,CI	M/H	G.White
Bunch-Bunch IP FB(Intra-Pulse)	JAI	M	J.R.Lopez
FS Core Software Dev.	SLAC	M(Ongoir	G.White
EXT Bunch-Bunch FB	JAI,Oxford	L/M	J.R.Lopez
Integrated Automated Tuning	SLAC	L	G.White

Hardware Direct	Hardware Direct		
Project Title	Contributing Institutes	Priority	Leader
EXT Orbit Corr./FB	SLAC,KEK,LAL,CI, JAI	VH	
FFS Orbit Corr./FB	SLAC,KEK,LAL,CI, JAI	VH	
IP FB(Pulse-Pulse)	LAL, JAI	H+L	
C&S-Band Cav.BPM IOC Dev.	JAI,UCL	VH	S.Booget
IP Cav.BPM	KEK	M	Y.Honda
Magnet Mover IOC Dev.	SLAC	M/H	J.Nelson
EPICS Interface for WS/etc	JAI(LW?)	M/H	
Software Interface for IP BSM	Tokyo	M/H	Y.Kamiya
Bunch-Bunch IP FB(Intra-Pulse)	JAI	M	P.Burrows
Controls Infrastructure Dev.	JAI,SLAC,KEK	M(Ongoir	N.Terunuma
EXT Bunch-Bunch FB	JAI,Oxford	L/M	P.Burrows
EPICS Readout of Fiber-PLIC		L	
PS IOC Dev.	SLAC	L	

Commissioning Schedule in JFY2008

DR studies

RF gun and linac, injection …

Commissioning for RI

ATF2 hardware

High beta operation

10 2008

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 2008

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 2008

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			

Fast Kicker

Hardware commissioning at site

1 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

Cold cavity BPM

2 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

3 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				

- preparation of radiation inspection
- radiation inspection (RI)
- fast kicker study (cannot extract the beam)
- nominal beam study time

Nominal beta operation

Radiation Inspection, 10th December, 2008

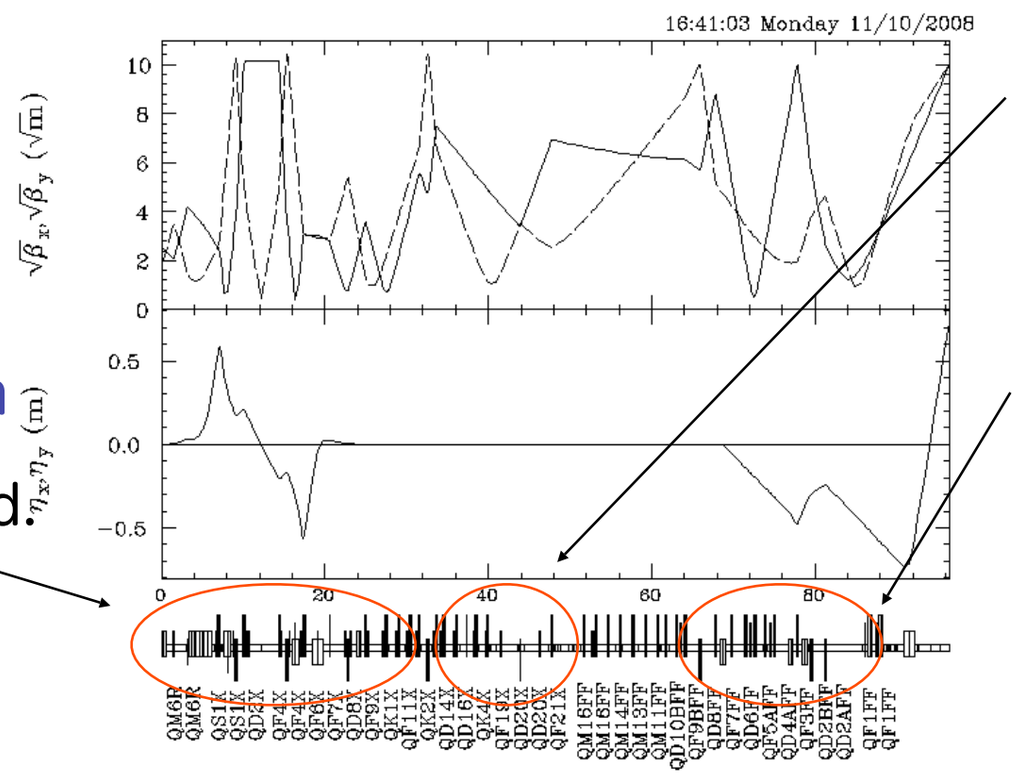
Requirement : operation with 40mA in DR at least.

>15 bunches in DR with 1×10^{10}/bunch

- a few trains in DR

Same optics to design

Strength is not changed.



Matching quads

-Only 6 QEA magnets

-Turned off the QEA magnets in extraction

-No Laser Wire and Coupling Study

- High DR injection efficiency

  optimizing the gun parameters, injection matching and so on.

- Reduction of the radiation loss in extraction line.

High Beta Optics

Y.Okugi, 22 Oct.08

Purpose of High Beta Optics

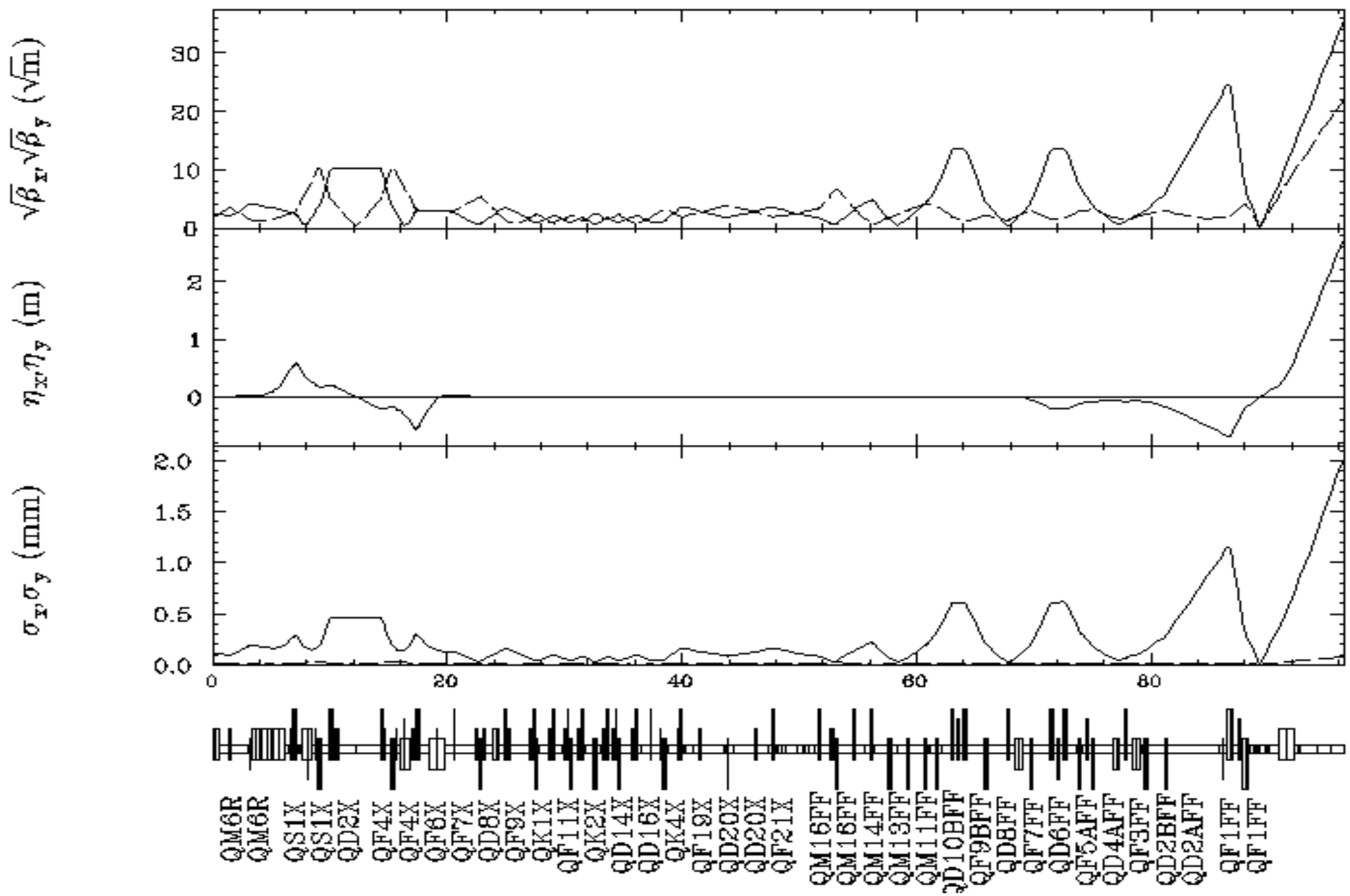
$10\mu m < \sigma^*_x < 15\mu m$

$1\mu m < \sigma^*_y < 2\mu m$

-Turn on all magnets.

- Orbit tuning with all magnet movers.

- Make the small beam size for IP-BSM measurement



preparation
scheduled
not yet scheduled

		Sep.08	Oct.08	Nov.08	Dec.08	Jan.09	Feb.09	Mar.09	Apr.09	May.09	Jun.09
ATF beam time (schdule)											
Radiation Safety Inspection.											
For Radiation Inspection	New RF gun commiss.										
	Beamline commissioning										
	Injection stabilization										
	Reduction of radiation loss										
Hardware Commissioning	EXT Hardwares (Timing, ICT, Screen, Stripline)										
	Magnet & Power Supply										
	Q-BPM										
	Magnet Mover										
	IP-BSM Monitor										
	Final Doublet										
DR study	Fast kicker R&D										
	Fast-ion										
	Monitor (XSR, Laser Wire)										
	DR BPM Study										
	DR Emittance Study										
Ext & FF study	QM7R & Septum Emittance Growth										
	BBA										
	EXT Orbit Correction										
	FF Orbit Correction										
	Dispersion Correction										
	Coupling Correction										
	Beta Matching										
	Orbit Modeling										
	ATF2 FF Tuning & Study w/o IP-BSM										
	ATF2 FF Tuning & Study with IP-BSM										
	FONT (Intra-train Feedback, EXT & IP)										
	Orbit Feedback (Slow FB, EXT & IP)										
	Laser Wire										
Control Software Integration											

Schedules for Oversea Collaborators		Sep.08	Oct.08	Nov.08	Dec.08	Jan.09	Feb.09	Mar.09	Apr.09	May.09	Jun.09
ATF beam time (schdule)											
Radiation Safety Inspection.											
SLAC	**SLAC Team Contribution Summary**										
	John Amann										
	Briant Lam										
	Doug McCormick										
	Steve Molloy										
	Janice Nelson										
	Johnny Ng										
	Mauro Pivi										
	Andrei Seryi										
	Cherrill Spencer										
	Glen White										
	Mark Woodley										
	Feng Zhou										
LAL	**LAL Team Contribution Summary**										
	Philip Bambade										
	Yves Renier										
	Cecile Rimbault										
	Filimon Gournaris										
LAPP	**LAPP Team Contribution Summary**										
	Andrea Jeremie										
	An Engineer (not yet fixed)										
	Benoit Bolzon										
Daresbury	**Daresbury Team Contribution Summary**										
	Deepa Angal-Kalinin										
	James Jones										
	Anthony Scarfe										
JAI-Oxford	**JAI-Oxford Team Contribution Summary**										
	Javier Resta Lopez										
	Tony Hartin										
	Constance										
	Swinson										
	Apsimon										
	Bett										
JAI-RHUL	**JAI-RHUL Team Contribution Summary**										
	Stewart Boogert										
	Alex Aryshev										
	Alexey Lyapine										
IHEP	**IHEP Team Contribution Summary**										
	Sha Bai										
CERN	**CERN Team Contribution Summary**										
	Rogelio Tomas Garcia										
	Frank Zimmermann										
KNU	**KNU Team Contribution Summary**										
	Hyoung-Suk Kim										
	Aeyoung Heo										

Summary

1. International commissioning team has been formed.
2. Software projects have been defined with priorities.
3. ATF2 will be commissioned for the radiation inspection on 10th December 2008.
4. Successively, ATF2 will be commissioned with the high beta optics, i.e. the complete configuration.
5. More international contribution is expected and strongly encouraged, i.e. international leadership.