

ATF2 Commissioning

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ILC EC, 4 September 2008

Hardware Issues

due to budget shortage in JFY2008

The highest priority is to transfer beam to the dump at ATF2.

- (1) There are 14 stripline BPMs in total at new extraction line and ATF2. The cables are reused from present ones.
- (2) There is only one ICT. MC1X will not be available behind QD20X.
- (3) There are 4 skew quadrupoles for the coupling correction. At present, only QK1X and QK4X are available together with 20A power supplies. Remained two skew quadrupoles will be produced in 2009.
- (4) Honda monitor and sweeping magnet is not funded.
- (5) Laser tracker system (Raika co.) is close to the lifetime (> 15 years old). It is still OK at present.

Software Issues

Coordination is important for international collaboration.

(1) Commissioning strategy, tools

The commissioning team was organized.

(2) Flight simulator for modeling the beam line and tuning.

Demonstration has been done at the present extraction line.

(3) Magnet movers and QBPMs etc.

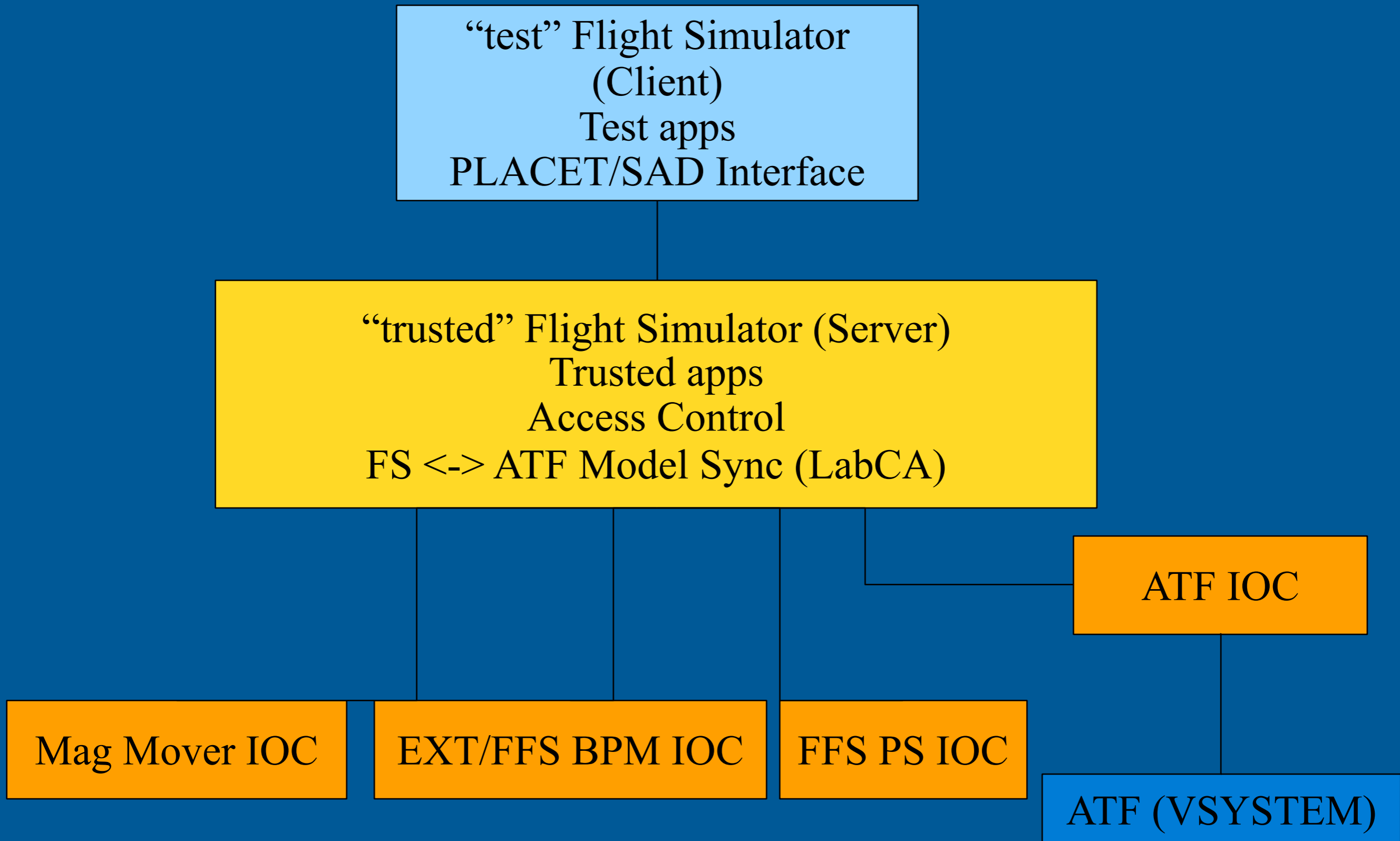
Corresponding sub groups have responsibilities.

(4) Remoto participation

international-capable phone line, good video equipment will be prepared. Also, ATF data server, eLog system will be improved.

Both are KEK's responsibility.

Implementation at ATF(2)



Organization of Commissioning Team

Goal of the team is to achieve the target beam size, i.e. $\sigma_y=37\text{nm}$, 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

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.

Organization of Software Projects

Expression of interests (Eols) 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

Priority of the Commissioning Task

Main task of the commissioning team is to achieve the 37nm vertical beam size at IP.

1st priority in 2008 is to pass the radiation inspection, on 10th December.

In the radiation inspection, we must operate the ATF with 10% of the maximum beam power with 2×10^{10} bunches at 12.5Hz.

Also reduction of the injection loss to DR is important.

- new RF gun to reduce the dark current.
- update of LINAC water system for temperature control.

Commissioning Team Member (beam tuning) as of 2008 / 4 /23

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	2 months/year	
LAL	Philip Bambade	Philip Bambade	12 months frm 2008.10	Emittance tuning studies (DR to extraction line)
		Yves Renier	11 months frm 2008.10	
		Filimon Gournaris	8 months frm 2008.11	
LAPP	Andrea Jeremie	Andrea Jeremie	2 weeks in 2008.10	
		Benoit Bolzon	8 months frm 2008.9	
Daresbury	Deepa Angal-Kalinin	Deepa Angal-Kalinin	2 months/year	
		James Jones	2 months/year	
		Tony Scarfe	2-3months for 08-09	
Oxford univ.	Philip Burrows	Javier Resta Lopez		FONT
		Tony Hartin		
		Students		

Strategy of ATF2 commissioning

Oct.-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

DR study
(fast ion, DR emittance ...)

Reduction of
radiation loss

Hardware study at the extraction line
(FONT, Laser Wire ...)

Injection
stabilization

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 ...)

Beam Commissioning Team Tasks and EoIs

Beam deliver to the dump with small beam loss

- Beam delivery to the dump KEK, ...
- New RF gun commissioning KEK, ...
- Good injection efficiency
(LINAC stabilization etc.) KEK, ...
- PLIC cable for beam loss monitor SLAC, ...

Hardware Commissioning for ATF2 (including the software work)

- Magnet HA-PS SLAC, KEK, ...
- Magnet movers
(beam steering test with mover) SLAC, LAPP, KEK, ...
- Cavity BPMs (S and C-band)
(calibration of position sensitivity with beam) JAI, UCL, SLAC, KNU, KEK, ...

IP BSM studies

- Laser Interferometer (Shintake Monitor)
- IP BPM
- Carbon Wire Scanner

U. of Tokyo, KEK, ...
KEK, KNU, ...
SLAC, KEK, ...

Feedback Study

- Orbit Feedback (pulse-to-pulse)
- Intra-train feedback at EXT and IP
- IP feedback (pulse-to-pulse)

KEK, SLAC, LAL, ...
Oxford, JAI, ...
LAL (software), ...

Beam size tuning at ATF2 final focus line

FF Optics studies

- with large beta optics
- by IP waist scan

LAL, IHEP, ...

IP beam size tuning with IP BSM

All

ATF2 Software Tasks , Sep. 2008

Beam Tuning Direct				Hardware Direct			
Project Title	Contributing Institutes	Priority	Leader	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	EXT Orbit Corr./FB	SLAC,KEK,LAL,CI, JAI	VH	
FFS Orbit Corr./FB	SLAC,KEK,LAL,CI, JAI	VH	A.Scarfe	FFS Orbit Corr./FB	SLAC,KEK,LAL,CI, JAI	VH	
Beam Line Modeling Tools	SLAC,CI	M	S.Molloy				
IP FB(Pulse-Pulse)	LAL, JAI	H+L	Y.Renier	IP FB(Pulse-Pulse)	LAL, JAI	H+L	
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				
				C&S-Band Cav.BPM IOC Dev.	JAI,UCL	VH	S.Booget
				IP Cav.BPM	KEK	M	Y.Honda
Final IP Spot-Size Tuning	SLAC,KEK,LAL,Tokyo,CERN,CI	M/H	G.White				
				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	J.R.Lopez	Bunch-Bunch IP FB(Intra-Pulse)	JAI	M	P.Burrows
FS Core Software Dev.	SLAC	M(Ongoir	G.White				
				Controls Infrastructure Dev.	JAI,SLAC,KEK	M(Ongoir	N.Terunuma
EXT Bunch-Bunch FB	JAI,Oxford	L/M	J.R.Lopez	EXT Bunch-Bunch FB	JAI,Oxford	L/M	P.Burrows
				EPICS Readout of Fiber-PLIC		L	
				PS IOC Dev.	SLAC	L	
Integrated Automated Tuning	SLAC	L	G.White				

Summary

ATF2 will be commissioned in end October 2008.

Progress and plan in 2008

- (1) Re-configuration has been completed in this summer.
- (2) Concrete shields and beam dump have been completed in April.
- (3) All magnets except for FD, 5 sextupoles have been installed at ATF2 beam line.
- (4) Power cables and cooling pipes have been installed.
- (5) The HA-PS system has been installed.
- (6) S band BPMs (4) were fabricated at KNU.
The electronics is provided by UK group.
- (7) Shintake monitor has been installed at IP. The optics system was commissioned with the pulsed laser in this summer.
- (8) FD system was arrived in August from LAPP, and will be installed in September.

Meeting schedule

- (1) Weekly meeting with ILC-Webex, Wednesday
- (2) A special meeting for the commissioning, 1 October, KNU, Webex