

Goals at this meeting

1. Commissioning status - critical review
 - BPMs, Carbon WS, IPBSM etc. and software
 - Continuous Run for High Beta Optics beam tuning
2. Plan the strategy and milestones
 - in details for the 1st and 2nd goals
by end of 2010 and 2012, respectively,
identifying key issues
3. Future plan after TDR, i.e. 2013
 - PM Q, SC Q and others including physics studies

T. Tauchi, A.Seryi, P.Bambade, 10th ATF2 Project Meeting, 6/30-7/2 2009

Parameters	unit	ATF2	ILC	CLIC	S-KEKB (LER/HER)
Beam Energy	GeV	1.3	250	3000	4/7
L^*	m	1	3.5-4.5	3.5	0.47/1.3
$\gamma \epsilon_x$	m-rad	5×10^{-6}	1×10^{-5}	6.6×10^{-7}	$2.5/3.3 \times 10^{-5}$
ϵ_x	nm	2	1.0 (DR)	0.1 (DR)	3.2/2.4
$\gamma \epsilon_y$	m-rad	3×10^{-8}	4×10^{-8}	2×10^{-8}	$1.0/1.2 \times 10^{-7}$
ϵ_y	pm	12	2(DR)	1(DR)	13/8.4
β_x^*	mm	4	21	6.9	32/25
β_y^*	mm	0.1	0.4	0.07	0.27/0.41
η'	rad	0.14	0.0094	0.00144	
σ_E	%	~0.1	~0.1	~0.3	0.08/0.06
Chromaticity	L^*/β_y^*	~ 10^4	~ 10^4	~ 5×10^4	$1.7/3.2 \times 10^3$
σ_x^*	μm	2.8	0.655	0.039	10.2/7.8
σ_y^*	nm	37	5.7	0.7	59/59

Parameters at ATF2

IP Parameter	nominal	May 2009	Dec. 2009	April 2010	May 2010
Beam energy	1.3GeV	1.3GeV	1.3GeV	1.3GeV	1.3GeV
Emittance in x	2 nm	1.7nm	1.7nm	1.7nm	1.7nm
Emittance in y	12 pm	11pm	<10pm	<10pm	<10pm
Beta function in x	4 mm	8cm	8cm	4cm	4cm
Beta function in y	0.1mm	1cm	1cm	1mm	1mm
beam size in x	2.8 μm	$\sim 10 \mu\text{m}$	$\sim 10 \mu\text{m}$	$\sim 10 \mu\text{m}$	$\sim 10 \mu\text{m}$
beam size in y	35 nm	not yet	1.5 μm	900 nm	300 nm

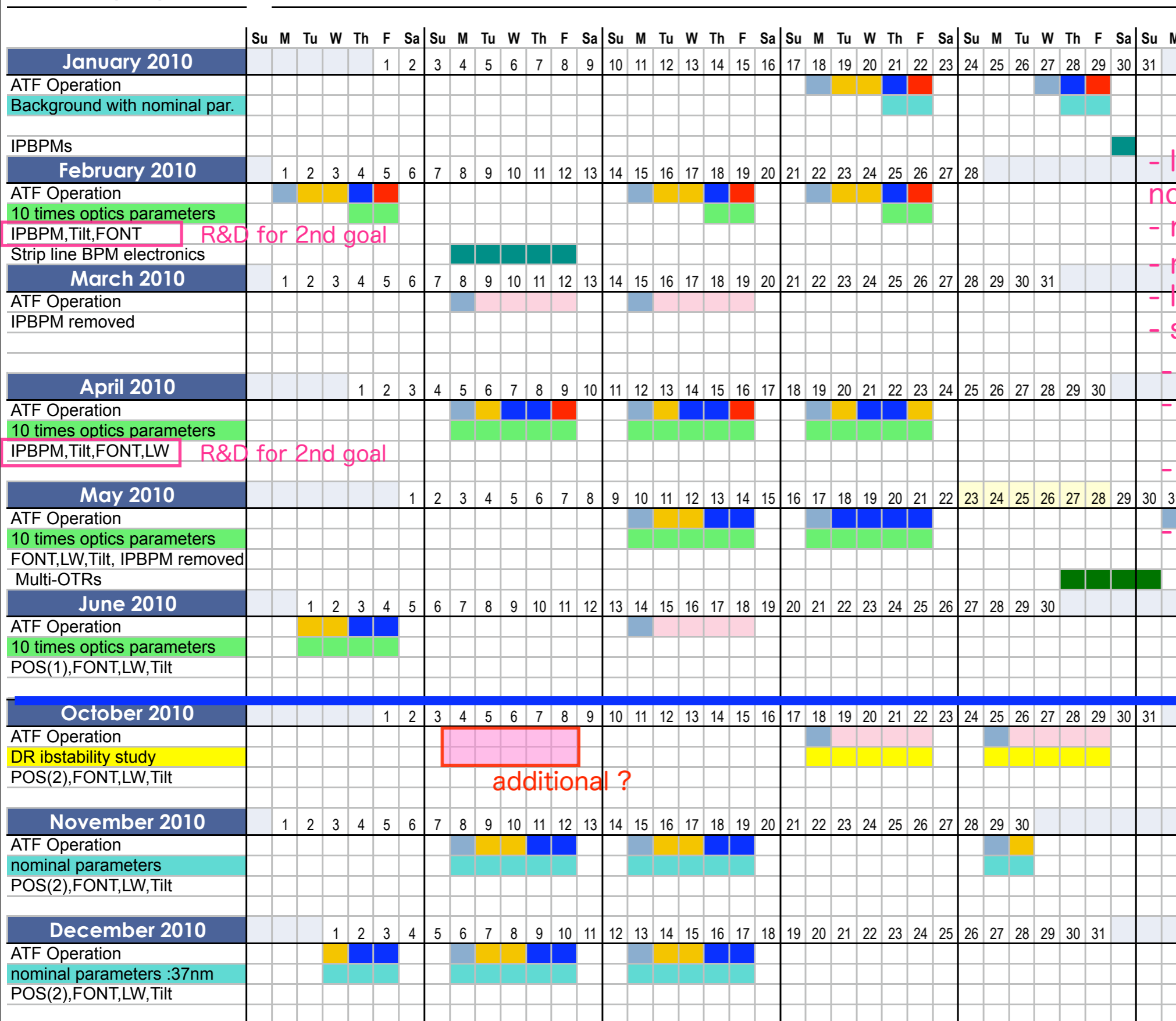
Requirements

Goal	ATF-EXT	ATF2
1	<p>Jitter < 30% of σ_y with no feedback</p> <p>$r \varepsilon_y = (4.5 \rightarrow 3) \times 10^{-8} \text{m}$ ($\varepsilon_y = 12 \text{pm}$)</p>	<p>BSM (laser in higher mode)</p> <p>BPMs with 100nm res. at Qs</p> <p>Power supplies of $< 10^{-5}$</p> <p>Active mover of Final Q</p>
2	<p>Jitter < 5% of σ_y (2nm jitter at IP) with feedback</p>	<p>BPM with < 2nm res. at IP</p> <p>IP Intra-bunch feedback for ILC style beam</p>

Operation with 10 times Beta Optics ($\beta^*_{x/y}=4\text{cm}/1\text{mm}$)

2010

Annual Calendar



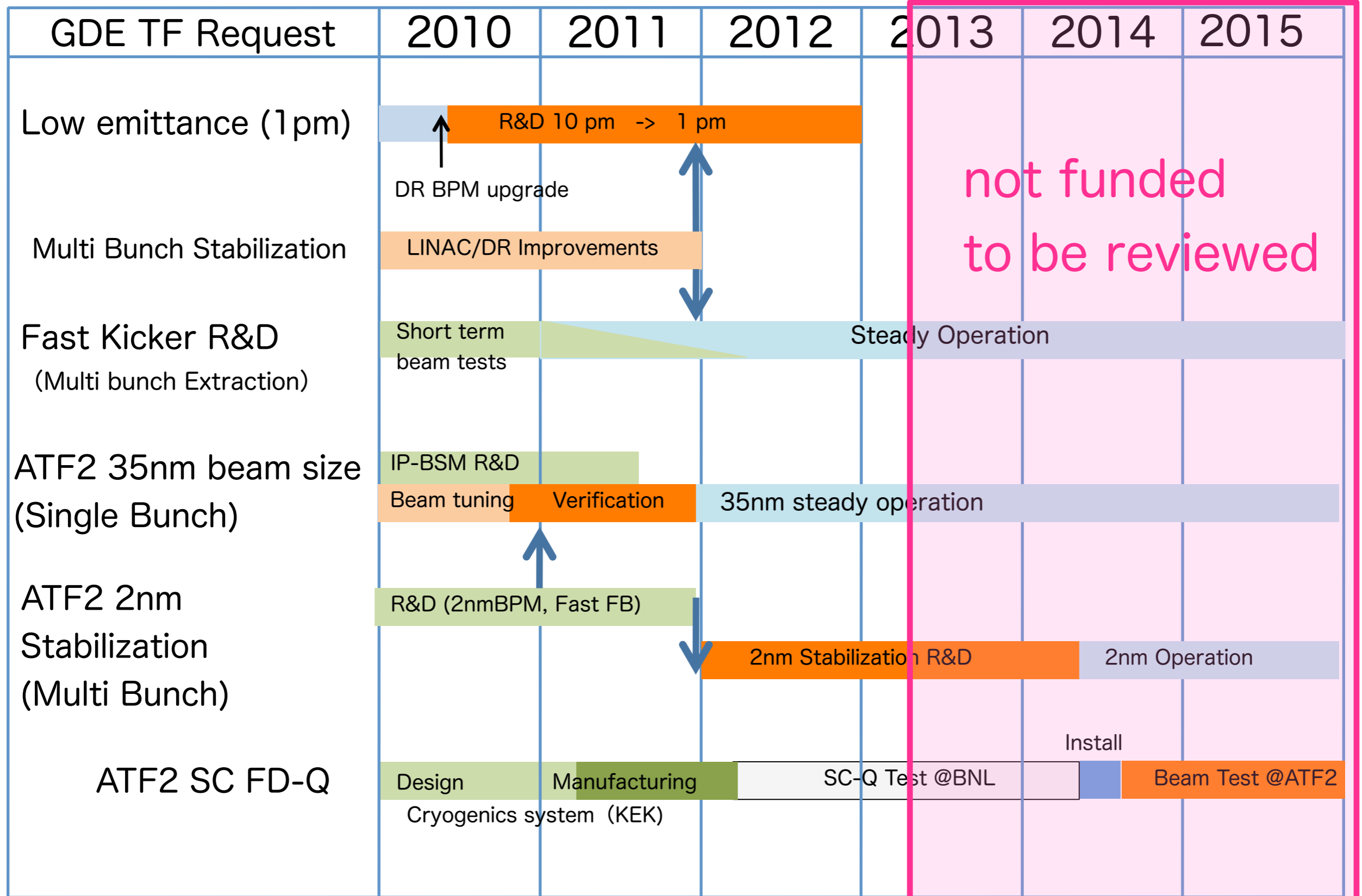
- DR Study + QBPM Calib + FONT + start up
- ATF2 beam tuning
- IPBPM with 2 to 174 degree
- Fast Kicker
- Installation

- large background at the nominal optics
- new stripline BPM electronics
- multipole field at 2nd kicker
- large wake field by IPBPM
- septum #3 re-aligned(tilt)
- BPM calibration established
- IPBPM fully commissioned
- 855nm beam size**
- Pre-continuous run (3 shifts)
- IPAC10
- Continuous run for a week
- 300nm achieved**

- In summer shutdown;
- QF1 field meas.
 - Carbon IP wires
 - new targets of OTRs
 - software

- Continuous runs ?
- Goal = 37nm

ATF long term plan



Key issues

1. Goal 1

Stability of LINAC and DR

- new modulators of #0 and #8 and re-alignment

Identification of “300nm limit” sources

- large rotation of QF1:alignment, field measurement
- efficient IP beam size measurement by Shintake monitor

Preparation of continuous runs

- hardware and software upgrades in this summer shutdown

2. Goal 2

Readiness of essential instrumentation

Fast kicker system

IPBPM and FONT at IP

3. Common for ATF operation

“Automatic” tuning/operation of injection system
operation outsourcing

“ATF2” works in this summer

1. New Modulators (#0,#8) at LINAC done
2. Alignment
 - DR, QF1 (also field measurement ?)
3. Laserwire (LW)
 - commissioning the laser system
4. Shintake monitor
 - addition of carbon wires, 2nd fringe pattern and phase feedback
5. New targets of multi-OTRs
6. Smoothing timing of fast kicker for the multi-bunch
7. Software development

Session Organization

	30th June Wednesday	1st July Thursday	2nd July Friday
9:00	<p>Introduction</p> <p>Instrumentation DR-BPMs, FONT5, QBPM, IPBSM (Shintake monitor), IPBPM, LW, Multi-OTR, Stripline kicker and BPMs</p> <p>Photo in coffee break</p>	<p>Towards the 1st goal IP instrumentation, FD field quality, software tools, background, priorities</p> <p>Future plan 2013 - Intense Field Physics WS Permanent Q at IP SC Q at IP</p>	<p>Future Collaboration Comments by KEK DG Suggestions Comments Discussion</p> <p>Summary</p>
12:30			
14:00	<p>Beam Tuning EXT, BBA, feedback IP tuning multi-knobs, Continuous runs, re-alignment of QF1</p>	<p>ART recommendation discussion</p> <p>Towards the 2nd goal DR stability, Fast kicker, IPBPM, Tilt monitor, FONT</p>	<p>TB/SGC Review of R&D Status ATF2 progress and near future Update of the SC-Q plan closed session Conclusion</p>
17:50			

18:30- Banquet

Goals at this meeting

1. Detailed plan or strategy for the goal 1 and 2
2. Prospect of future plan after 2013 and consensus building of the SC-Q plan
3. Initiation of discussion on future collaboration, discussing suggestions and expansions

Dr Theses

Year	university	country	Name	title	publication
2006.2.1	Queen Mary University of London	UK	Stephen Molloy	A Fast Feedback System Designed to Maintain Luminosity at a Linear Collider	
2007.11.12	Université de Savoie	France	Benoit Bolson	Etude des vibrations et de la stabilisation a l'echelle sous-nanometrique des doublets finaux d'un collisionneur lineaire	2 papers with title "Vibration measurementson Final Doublets and Beam Size Monitor atATF2" and soon submitted to PRSTAB
2007.12.21	University of Tokyo	Japan	Taikan Suehara	Development of a Nanometer Beam Size Monitor for ILC/ATF2	Nuclear Instruments and Methods in Physics Research A 616 (2010) 1–8
2008.2.1	Oxford university	UK	Christine Clarke	The Interaction Point Collision Feedback System at the International Linear Collider and its Sensitivity to Expected Electromagnetic Backgrounds	
2009.4.14	Royal Holloway, University of London	UK	Lawrence Deacon	A Micron-Scale Laser-Based Beam Profile Monitor for the International Linear Collider	PHYSICAL REVIEW SPECIAL TOPICS - ACCELERATORS AND BEAMS submitted (May 2010)
2010.6.8	UNIVERSITAT DE VALÈNCIA	Spain	María del Carmen Alabau Pons	Optics Studies and Performance Optimization for a Future Linear Collider: Final Focus System for the e-e- Option (ILC) and Damping Ring Extraction Line (ATF)	
2010.5.8	IHEP CAS	China	Sha Bai	ATF2 Optics System Optimization and Experiment Study	Paper with title "First beam waist measurements at the Accelerator Test Facility 2 at KEK" submitted to PRSTAB
2010.6.11	Université Paris-Sud 11	France	Yves Renier	Implementation and Validation of the Linear Collider Final Focus Prototype ATF2 at KEK (Japan)	
2010.8.1	Oxford university	UK	Christina Swinson	Development of Beam Position Monitors for Final Focus Systems at the International Linear collider	
2011.12.1	University of Tokyo	Japan	Masahiro Oroku	Beam Tuning with the Nanometer Beam Size Monitor at ATF2	
2011.12.1	Kyungpook National University	Korea	Youngim Kim	IPBPM and BBA	
2011.12.1	University of Manchester	UK	Anthony Scarfe	Tuning and alignment of ATF2 and ILC	
2012.2.xx	University of Tohoku	Japan	Taisuke Okamoto	cavity-type tilt monitor of beam orbit for ILC	
2012.12.1	Kyungpook National University	Korea	Siwon Jang	IPBPM and BBA	
2012.12.1	CERN	Spain	Eduardo Marin Lacoma	Ultra Low Beta Optics	
	Oxford university	UK		FONT studies	
	ICIF, Valencia university	Spain	Javier Alabau-Gonzalvo	emittance, coupling measurementwnts with multiple OTR system	