

Questions/ Priorities For Achieving ATF2 Goal 1

Glen White, SLAC.

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ATF2 10th Collaboration Meeting, KEK

Reasons for not progressing below 300nm (1)

- **Sextupole multiknobs not correct / not orthogonal**
 - Check dispersion knob against measurements
 - Check BBA, roll alignment, strength calibration, polarity of FFS sextupole magnets.
 - Phase advance correct between sexts? Response matrix checks...
- **Dominant error terms at IP other than α_y , $\langle x'y \rangle$, η_y**
 - Higher-order multipole fields in e.g. QF1FF
 - Check possible error sources in model.
 - Magnet roll/offset/strength error tolerance plot with these aberrations removed.
- **Large time-dependent IPBSM measurement drifts**
 - Multi-hour steady-state running in <500nm regime to test systematics of IPBSM + feedbacks etc.

Reasons for not progressing below 300nm (2)

- **Beam not well matched at IP**
 - Post-IP carbon wire measurement with beam at IP indicated beta-function approximately correct.
 - Irwin knob reduction of beta-function by factor 2 attempted with no observed improvement in beam size.
 - More thorough check of beta-function possible next time?
- **IP beam-shintake monitor fringe jitter large**
 - Introduce IPBPM
 - IPBSM phase monitoring
- **Orbit drift dependent effects**
 - Feedbacks
 - Modeling to understand of orbit-drift dependent beamsize effects.

How many / when to have continuous tuning shifts

- Use first 4 weeks “R&D mode” for discrete diagnostic tests / software development and testing.
- 1 cont. run in last week Dec running.

Optics

- Bkg tests in October for nominal optics.
- Start with nominal optics configuration.

QF1 FF

- Re-align to spot-size minimised rotation angle ($\sim 6\text{mrad}$) ?
- Swap with QD0FF?
 - If suspect higher-order fields a problem
- Measurements over summer shutdown?
- Special meeting to be announced soon.

Install IPBPM By Nov?

- Suggestion to start with KEK IPBPM doublet.
- Measure IP beam jitter and use to reduce systematics in IPBSM
- High-precision downstream IP-phase measurements
 - e.g. Higher-order steering effects to look at higher-order magnetic field components.
- Need additional start-up procedure
 - Beam alignment at IPBPM
 - Adds to tuning complexity
- Probably need additional persons not to take effort away from existing priority tasks, e.g. optimisation of S-Band BPM system.
- Announce special meeting soon

ATF2 Tuning Shift Schedule

10 2010							11 2010							12 2010						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
					1	2		1	2	3	4	5	6				1	2	3	4
3	4	5	6	7	8	9	7	8	9	10	11	12	13	5	6	7	8	9	10	11
10	11	12	13	14	15	16	14	15	16	17	18	19	20	12	13	14	15	16	17	18
17	18	19	20	21	22	23	21	22	23	24	25	26	27	19	20	21	22	23	24	25
24	25	26	27	28	29	30	28	29	30					26	27	28	29	30	31	
31																				

- 4 weeks "R&D mode"
 - 2 weeks Nov, 3 weeks December
 - October reserved mainly for fast extraction kicker and multibunch studies.
- 1 week continuous run
 - Dec 13-17

Shift Tasks Week 1

- Establish nominal optics
 - Background studies with LLR system
 - IP match check
- Tuning setup procedure with IPBSM
 - Steering / orbit bumps to fix beam orbit in IPBSM and through to IPBSM
- Detailed model checks
 - Response matrix checks with high-res BPMs
 - Tilt error assessment from magnet moves of all FFS magnets and coupled orbit measurements with BPM system

Shift Tasks Week 2

- Steering software tests
- Software automation tests for IP tuning
- Model tests
- Feedback software improvement tests
 - Sext position feedback
 - IP position feedback

Shift Tasks Week 3

- Tune beam to $\sim < 500\text{nm}$
- Multi-hour beam stabilisation tests
- Multiknob orthogonality tests

Shift Tasks Week 4

- Cont. Run week preparation.

Shift Tasks Week 5

- Continuous run
- 174-degree mode IPBSM checkout