Planning Ahead for Oct-Dec Operations Period

Glen White, SLAC

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Overview

- How to best plan for maximum chance of goal A success by year end?
- Before technical issues should be discussed, first make some comments on methodology
  - In light of experience so far and considering external pressures of moves towards more international future engagement, now is a time for a hard, self-critical examination of how we operate (well past due in fact…)
    - *Or at least starting to do so*
  - This has been often discussed in the past, the most at Jan collaboration meeting with concrete proposals made but this has been mostly ignored. Time to “put-up or shut-up”.
- Planning for construction of Oct-Dec run plan over summer shutdown
- Beginnings of outline for Oct-Dec running
- Review of key study items for Goal A tuning readiness

Planning "goal-1" shift blocks

(PB: **discussed at 11th and 12th ATF2 meetings, Jan. & Sept. 2011**)

Success of ATF → federation of independent R&D teams
→ flexible & open user-operated facility
→ largely inherited by ATF2

Goal 1: 1) obtain σ_y ~ 35 nm at focal point
2) reproduce reliably small σ_y, maintain over time

- NEEDS all components of the entire facility to operate reliably, and all at once
- Operation ~ as for "luminosity" in facilities operated for physics

HOW to reconcile these requirements with our operation style ?

(1) continuous blocks of 6 shifts "dedicated to goal 1" every week,

(2) define three rotating teams with:

1 BSM expert + 1 beam tuning expert + 1 ATF operation expert

(3) support from the whole collaboration for analysis and software

Critical Review of International Collaboration and ATF2 Operations

- A major part of the goal of ATF2 is supposed to be learning to implement accelerator operations in a global context
- Some progress on this over the years but still very much running in “ATF” mode
- Decisions at collaboration meetings do not always match with on-the-fly “local” decisions made (all guilty of this)
- Contribution of foreign workers that should be an integrated part of the ATF2 tuning effort still treated as independent projects detached from the main.
  - E.g. little feedback or common ownership feeling on hardware problems critical to ATF2 performance
  - Not the feeling of “ATF2 members”, more individual project operators. Doesn’t have to be this way, we are more than willing to accept criticism and direction from the “working ATF2 body”. You can tell us what to do! Need feedback…
  - Often have to guess at required input only for effort to be wasted as this wasn’t really wanted or done locally anyway
  - Duplication of software, confusion over responsibilities
- Need better oversight
  - Needs assigned KEK-based scientist to understand tuning issues and properly co-ordinate effort on global, not just local basis
  - External to those directly involved in formulating and performing tuning

- Need better integrated advanced planning, with input from all parties
  - Resumption of regular meetings over summer shutdown to agree on written tuning procedure. Had in the past but tended to be mainly between only foreign collaborators.
- Training program Apr-June was not implemented as well as it could have been. Common complaint is weak overall management of this- not put together as had been envisioned by Jan collaboration consensus. And confusing. Another example of Ad Hoc short-term planning over more longer-term implemented plans.
  - There has been a detailed training effort of foreign workers by foreign workers over the years to produce some extremely capable accelerator scientists, but this has largely been self-motivated and not more integrated into the local culture. As outlined in recent efforts to proscribe a more rigorous training program, there was the attempt to more formally integrate this effort which would have been to the benefit of the collaboration, but this seems to have been unwanted judging by the level of engagement in the recent training program implementation.
- All in all, I think that the summed efforts of all the people involved have not been utilized anywhere near as much as they could have been which has been to the detriment of the project as a whole.
- In order to have the best possibility of success Oct-Dec
  - Need to decide to properly formulate and earnestly implement a truly globally integrated machine tuning group and organise run planning around this
  - Or admit that the only real chance of success is operating machine in standard in-house fashion (easier) and stop wasting the efforts of international collaborators trying to guess how their efforts are supposed to fit in.

Action Plan Needs to be Formed over Summer Shutdown

- Re-instigate periodic meetings to discuss key tuning issues
  - Start next Friday with meeting to discuss simulations of current optics performance.
- Come up with coherent run plan formatted in a way that can be followed by trained operators
- Issued raised with optics choice, expected performance etc
  - Reconcile through simulation and reference to past data
- Preparation of detailed run schedule
  - Early distribution
  - Identification of tuning personnel and logistics planning
  - Single on-wiki description
- Need item-by-item discussion of various tuning systems
  - Understand who is doing what
  - Agree on what is being done
  - As envisioned long ago at 2008 LAL software conference but not followed through

Run Scheduling

10 2012

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 2012

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 2012

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					

- October
  - “commissioning” of upgraded IPBSM
  - Re-commissioning of linac with modulator upgrades
  - Other commissioning items if e.g. magnets changed
  - Study issues
    - Low-emittance extraction and stability study
    - IP matching
    - IPBPM setup & alignment of FD orbit / IPBPM system with IPBSM detector
    - 3Hz operations?
    - IP feedback tests?
- November 5-16
  - Instigation of coherent, proceduralised tuning plan.
  - Further student “on-the-job” training
  - First attempts at 30-174 degree mode tuning
- November 26 – December 21
  - Continuous tuning

Most Important Outstanding Issues for Goal A

- EXT horizontal emittance
- Optics that take into account multipoles
  - It is not sufficient to simply re-match using linear Twiss parameters, you HAVE to take multipoles into consideration to reach <40nm
- EXT vertical emittance
- Stability of emittance
  - Find extracted orbit which is insensitive to small changes and MAINTAIN
  - MB1X/MB2X critical for this but currently only useable by analysis of scope traces
- IPBSM stability, reproducibility
- Agreement with overlap regions between C-wire and IPBSM modes and understand beam tuning with respect to expected effect of changes applied
  - ie understanding of “modulation reduction factor”
  - **Otherwise, nobody should or will believe any results!**
- IP beta-matching
- Use good scanning techniques
- Implementation and FOLLOWING of pre-defined tuning plan
- <um monitoring of IP orbit
- Setup of “golden” BBA orbit through FD system coupled with IPBSM detectors?