

DRAFT: Summary of discussion
in Thursday morning.

K. Kubo

Define Goal

- Confirm beam size at IP, $< ##$ nm
 - Or, Make clear the reason why we cannot have small beam.

Some opinions

- Goal should be 40.
- Final goal is 40 but the goal in autumn run may be different.
 - Solve problems one by one.

Strategy

Agreed with step by step strategy.

- Concentrate on observing clear modulation with 174 mode in the first step. Then, go to next.

Example:

- Step 1: Establish condition for IPBSM174 deg mode
 - Make <2 um using carbon wire monitor.
 - Use IPBSM <-30 deg mode, tuning by linear knobs.
 - IPBSM174 deg mode. Observe clear modulation.
 - Make all angle modes of IPBSM ready.
 - If failed, investigate why, re-start from tuning of upstream, or IPBSM.
- Step 2: Further tuning for smaller size.
 - If failed, investigate why, start from tuning of upstream, or IPBSM. May go back to step 1.
 - Keep all angle modes of IPBSM ready.

Optics choice

- 10x1.
- Optimized including multi-poles? Or same as last operation?
 - To be discussed later.
- Any possibility to change optics during operation?
 - No. Unless it appears necessary.
- Need decks of optics in actual operation in SAD, Lucretia, MADX, , , , .
 - Already have for present optics.
 - Easy to make when optics is modified.

Choice of angle mode of IPBSM

- Do not care absolute beam size from different modes. Look at relative change in each mode. (If modulation is clear.)
- 2-8 to 30 deg. after 1 or 2 sets of linear knob scans if results are stable and consistent.
- 30 to 174 deg. after 1 or 2 sets of linear knob scans plus non-linear knob scans, if results are stable and consistent.
 - (Used knobs should be decided later.)

Horizontal emittance

- We do not have any theory which might explain the problem.
- What to do in beam operation:
 - Check M-OTR system
 - Compare with wire scanners
 - Measure in DR (Two monitors, LW and SR-interferometer at small η_x will be available.)
 - Look dependence on EXT orbit
 - This is good as training.

EXT/FF set up and tuning

Do we have agreed procedure? Procedure in last operation was: (From slide of G.W.)

- Steering, EXT dispersion, coupling
- Turn off FFS sextupoles
- IP beam on waists with QD0/QF1
- Reduce IP vertical dispersion $< 0.1\text{mm}$ with QD0 tilt
- Minimise coupling by reduction IP σ_y with roll optimisation of strongest FFS matching quads (QM14=600urad, QM12=300urad)
- Switch on SD0FF
 - Recover 0 dispersion situation with vertical mover
 - Recover waist situation with horizontal mover and QD0 waist scans
- Other sextupoles: previously calculated BPM BBA offset values

To be discussed afternoon.

Optics matching at IP

Before multi-knob scan

- What should be adjusted? in what accuracy?
- In EXT too? Or only at IP?
 - Since measured optics in EXT and at IP are consistent, it does not matter.
- Method ?
 - Change QM##FF strength?

To be discussed afternoon.

Monitors to be prepared in summer

- For monitoring MB1X and MB2X
- H-beam size monitor at SR2 location (small η_x)
- DR LW
-
-

Skew Quad in FF

- SK1FF seems too weak.
- Alignment tolerance is loose for “present” strength. (But tighter for stronger setting?)
- No magnet is available until the end of this year?
- If we have a better magnet, we will exchange.

Other opinion

- Skew sextupole will not be effective for beam tuning.
- Using it can make condition worse.
- Not orthogonal to other knobs.

Quad swap

- We can swap 9 pairs.
- Bad ones are at sensitive locations.
- Effect of the swapping should be checked again.

Other opinion:

- Considering the big job, do not swap. There must be other things more important.
 - Effect is visible only for small β_x^* , can be mitigated by increasing β_x^* .
 - Do not change many big things at once.

Conclusion:

- Decide after checking effect of swapping again. (Check by Okugi and White)
- Meeting on Friday next week.

Magnetic Material around FD

- Connectors of cooling water and feed-through of S-band BPM may cause significant field error.
- Measurement at SLAC was done with the materials for cooling water. (may not with S-band BPM).
- Remove the S-band BPMs or not.
 - Decide in meeting next week.

IPBSM

- More reliable alignment of component on the vertical table
- More accurate (easier) adjustment of positions of two laser beams.
- Easier (simple and quick) angle mode change.
- Same path length of two laser beams.

Other suggestions

- Removable mirror for each laser beam to monitor at focal point (after final focal lens).
- Fringe contrast should be monitored.
 - 1D contrast is going to be measured.
 - Must measure contrast at least offline.
 - Measure 2D contrast (include tilt), not only 1D.