Rough plan of Beta-matching in Extraction line

20080820

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Goal and task members

- Goal:

  To set correct (designed) Twiss parameters at the exit of EXT (entrance of FF).

  The first beam test will be in December (?).

- Members

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Procedure of beta matching

1. Measure Twiss parameters around the extraction kicker in Damping Ring.: Measurement of tunes changing quadrupole strengths around the kicker.
2. Calculate a proper setting of quadrupole magnets in the extraction line and set it. We need to decide which magnets should be changed. Strength of off-center QM7R (?).
3. Measure emittance and Twiss parameters in the extraction line.: Multi-wire measurement and/or Q-scan methods. We need to decide what is the best method (by simulations).
4. Calculate a proper setting of quadrupole magnets in the extraction line and set it. We need to decide which magnets should be changed.
5. Perform 3 again to confirm the matching.
6. Iterate 4 and 5 if necessary.

To be carefully considered

- Strength of QM7R (Extracted beam goes through off axis of this magnet.)
  - What is quadrupole field component?
  - Effects of multi-pole components?
- Error of beam size measurement
  - Performance of wire scanners
  - Effects of beam jitter

Simulation of beta-matching

- We should include “standard” (realistic) errors. Probably we may use the assumption, which Glen White used.
- Error of beam size monitors should be carefully considered.
- Limit of magnet strength, etc. should be taken into account.
- It is practical to perform simulations including all basic corrections: orbit, dispersion, (and maybe coupling).

This will be done by early October. 2008.

We may need to go back to simulations after beam test.

Prepare operation

- Prepare interface to ATF control. Define format of measured data and format of magnet setting control.

This will be done by the end of October,2008. (?)

First beam test will be in December?