Expected hardware status and Priority of the commissioning task

Toshiyuki Okugi

2008 / 6 /18

ATF2 Software mini-workshop

LAL, Orsay

Expected Magnet Status at the beginning of ATF2 commissioning

- We have all of the corrector magnets (ZHs and ZVs).

- All of the magnet movers are put to ATF2 beamline.
We need study of the coupling of the motion (x, y, roll, yow).
We need fix the stay position of the magnet.

- All of the magnet PS are in KEK, and adjusted the ripples.
They will be wired to the magnets and will be calibrated with actual loads.

- We may not have 2 skew quadrupoles (QK2X and QK3X).
The dispersion correction will be able to applied with QS1X and QS2X.
We should correct the betatron coupling only with QK1X and QK4X.
The two quadrupoles are high priority of JFY2009 budget.

Expected Monitor Status at the beginning of ATF2 commissioning

- *All of the C-band and S-band cavity BPMs will be put to the beamline, and the readout electronics will be wired.*
  - *We need to devolop the readout software.*
  - *We need to study of the calibration and position offset measurement.*
  - *We need to study of the reliability of the readout electronics.*

- *All of the screen monitors and OTR monitor will be ready.*

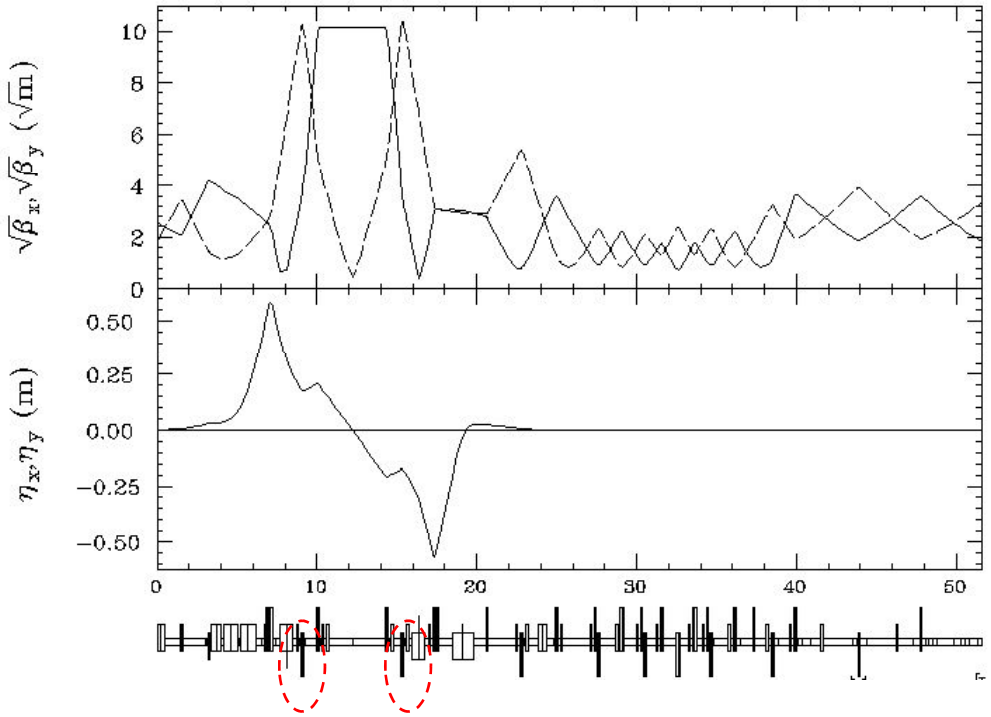
- *All of the wire scanners will be ready.*

- *We can use the Carbon wire scanner, but we cannot put the sweeping magnet.*

- *One of the ICT (MICT1X) will not be placed in the beamline.*

- *IP BPM will not be placed in the Shintake monitor chamber.*

Stripline BPMs



	Phase Advance from MQF1X	
MQF1X	0.000	0.000
MQD2X	168.066	4.651
MQF3X	169.934	5.568
MQF4X	172.341	175.627
MQD5X	173.557	176.841
MQF6X	342.993	179.821
MQF7X	364.341	201.254
MQD8X	442.892	209.395
MQF9X	499.201	224.782
MQF13X	680.337	463.554
MQD14X	723.433	485.897
MQF15X	782.005	502.695
MFB2FF		
MBUMP		

The number of the stripline BPM depends on the length of the present BPM cables.
The number of BPM will be fixed by September 2008.

Since red BPMs are high priorities than others,
we can use the BPMs at the beginning of the commissioning.
Since blue BPMs are a little bit low priorities than others,
some of them may not be wired at the beginning of the commissioning.
Even if we cannot wire some of BPMs, we will wire the BPM in JFY2009.

Priority of the Commissioning Task

The main task of the commissioning team is to achieve the 35nm vertical beam size at ATF2 IP.

But …

The 1st priority of the ATF2 commissioning in 2008 is to pass the radiation inspection. The radiation inspection is not only for ATF, but also for all of KEK accelerators.

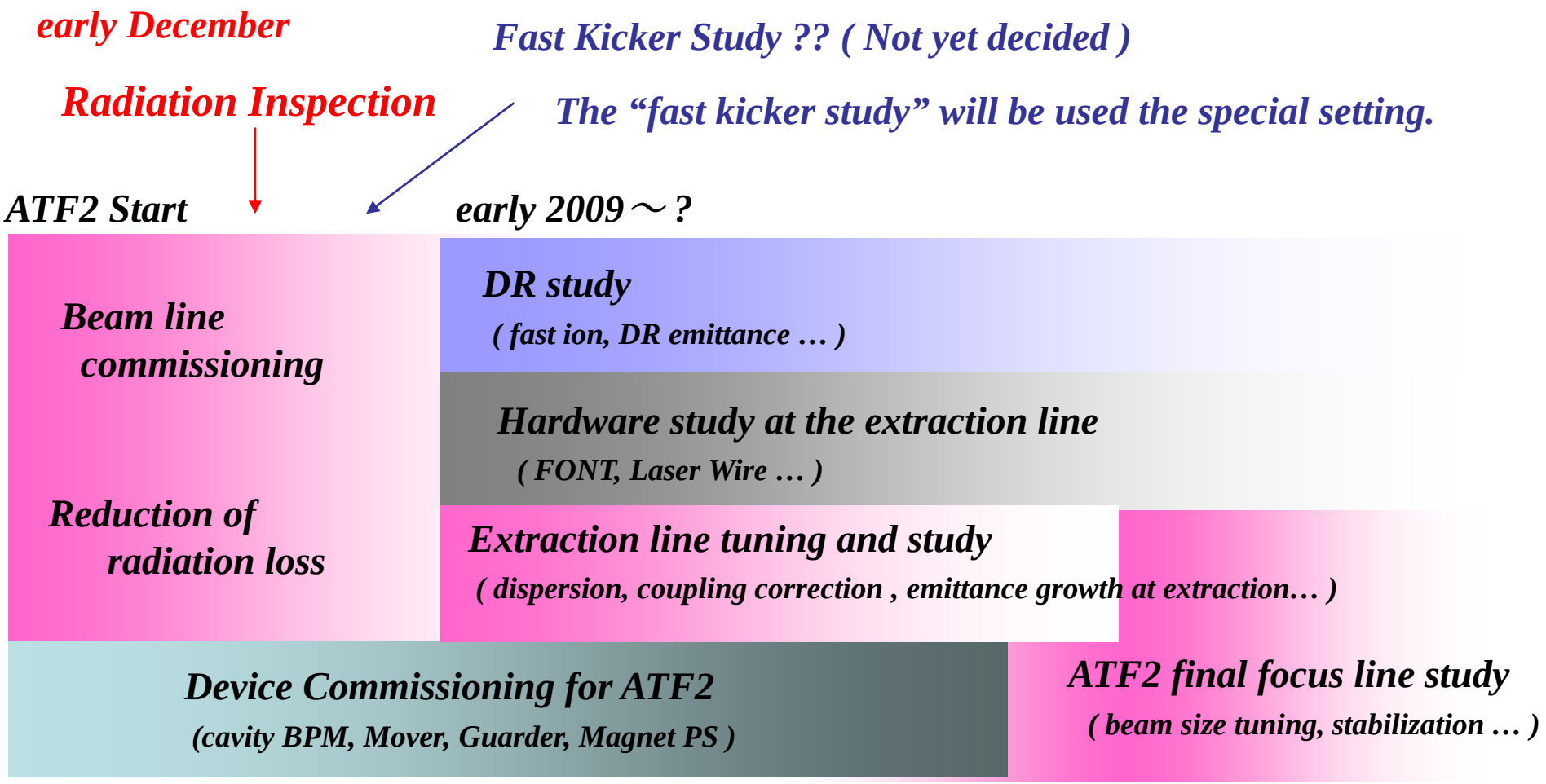
In the radiation inspection, we must operate the ATF with 10% of maximum beam power ($2x10^{10}$ 20 bunches 12.5Hz). The beam intensity is far from the normal operation.

We must concentrate not only ATF2 beamline commissioning, but also reduction of the injection loss to DR.

- ***We will install new RF gun to reduce the dark current.***
- ***We must put more radiation shield etc. .***

Thereby, we have no idea how much time will be prepared for the ATF2 beam study in 2008. I think most of the beam study will be started from early 2009.

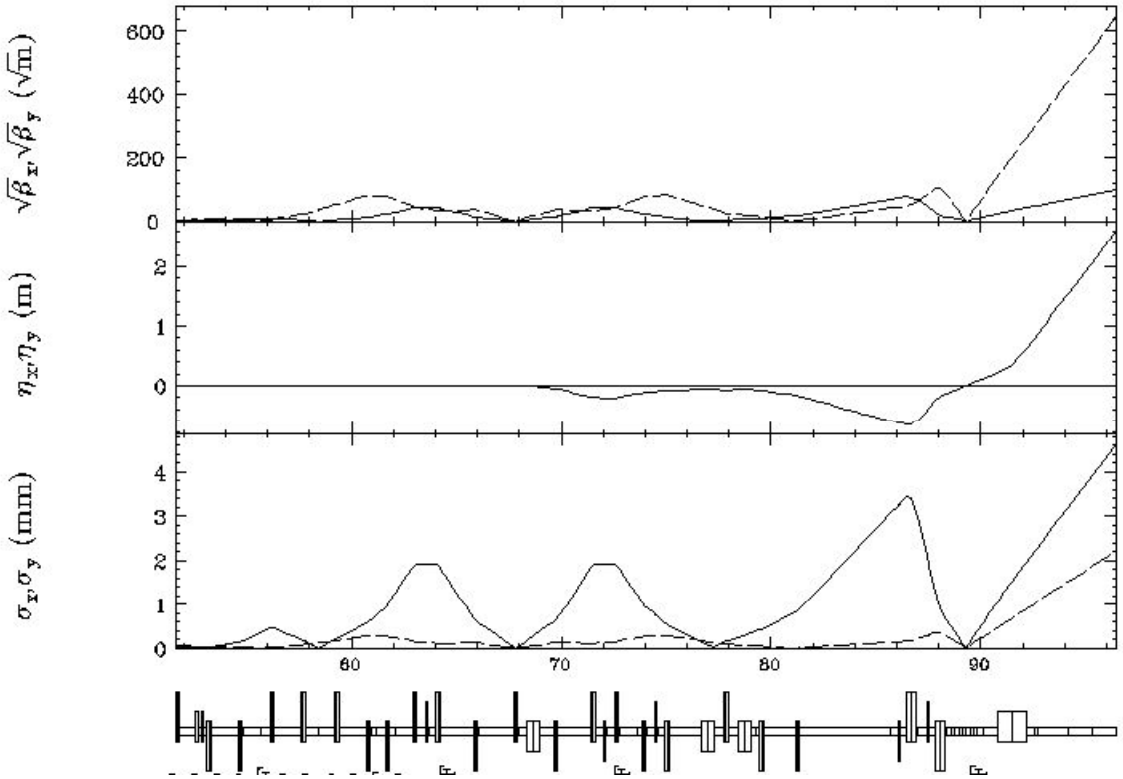
Schedules of ATF2 commissioning



Beam deliver to the dump with small beam loss

I think it is better to use the simple and easy optics to deliver the beam to the dump at the beginning of the ATF2 operation.

Normal Optics



Advantage

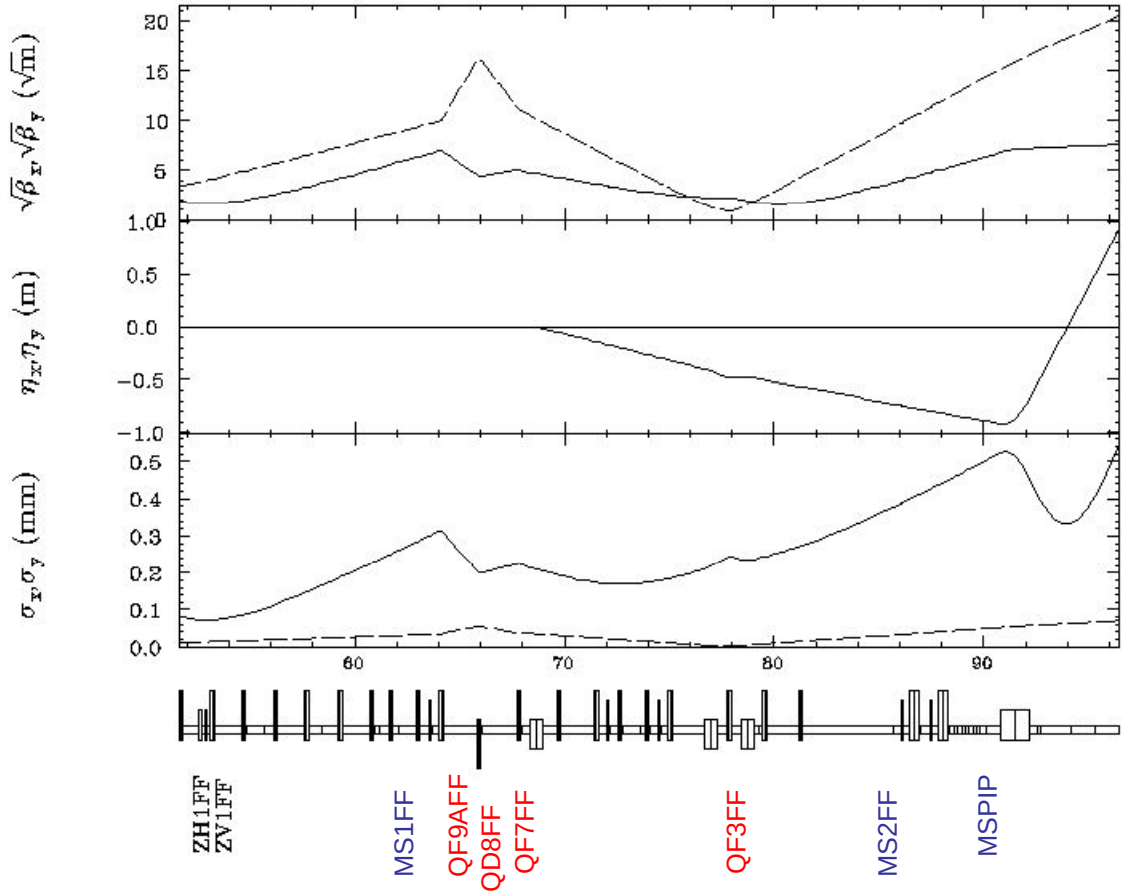
Easy to shift to
the beam tuning phase

Disadvantage

Large beam size

Large number of ambiguity

Example of Special Optics for Commissioning



Extraction section

same to the nominal

Final focus section

turn on only 4 quads

QF9AFF 0.293 1/m
QD8FF -0.387 1/m
QF7FF 0.144 1/m
QF3FF 0.195 1/m

Advantage

Small beam size
Possible to be BPM calibration
Possible to be first step of BBA
Mechanical alignment of bending magnet rotation
Fix the strength of the bending magnet and easy to make a orbit reference

Disadvantage

Small number of beam steering knob
Difficult to put IPBPM