

***Summary of beam operation
from the 8th ATF2 project meeting***

The hardware works in 2009 summer shutdown

We align the Final Doublet and all of the sextupole magnets.

We prepare the wide aperture vacuum chamber to BDMP.

We prepare new IP target with Screen, knife edge and wire scanner.

We install the new IP-BSM laser (400W -> 1500W).

Cavity BPMs

Diode was installed and the readout softwares were improved in order to avoid the sampling timing change.

We established the calibration procedure.

The calibration of all cavity BPMs in ATF2 beamline spends 4 hours.

The calibration constants for C-band BPMs was kept within 5% accuracy more than 3days.
Small readout position change between bunch population of $0.1-0.5 \times 10^{10}$.

The I-Q rotations for S-band BPMs are not stable yet.

We will investigate the unstability of I-Q rotation in this week.

Beam tuning

Optics Modeling (Orbit Response Matrix)

Orbit response measurement was used for the R12 response test.
DAC readback was used to calculate the magnet strength instead of ADC.
The optics model improved.

Some correctors are consistent with the model, but some are not. (?)

The orbit response measurement was also used
for quick test of the cavity BPM calibration.

Dispersion correction

Dispersions were evaluated with 2 methods.

- 1) Delta-f ramp in DR
- 2) orbit jitter analysis SVD matrix

The results are consistent each other.

The vertical dispersion correction is improved not only with QS1X, QS2X sum-knob,
but also with ZV5X, ZV6X and ZV7X local bump.

Vertical dispersion for all ATF2 beam line is corrected within 10mm.

Large horizontal dispersion at the end of straight line (500mm) sometimes exists.

BBA

BPM offsets with respect to magnets are measured.

All quadrupoles are aligned within 1mm range, but some BPMs for sextupoles has large offsets.

Mechanical alignment of sextupoles are measured with respect to nominal beam orbit for the preparation of nominal optics.

First 3 sextupoles are aligned within 1mm, the FF sextupoles are not yet measured.

IP-tuning

We concentrate to minimize the vertical beam size only.

We did not measure the horizontal beam size in 2009 autumn operation period.

We can achieve the vertical beam size almost the resolution limit (around 3um) of 10um tungsten wire at IP.

We minimized the vertical beam size to be 1.5um at post-IP with carbon wire scanner.

IP-BSM

The new IP target is very useful for beam size tuning and laser-beam collision.

The background was reduced to be 1/10.

We observed the laser interference patterns with beam for 2-4 degrees mode.
We measured 3 times the interference patterns (11/13, 11/20 and 12/4).

We established the procedures of the beam size measurement by interference mode.
It spend about 4 hours for the preparation work for IP-BSM measurement.

We did not yet established to evaluate the beam size from laser interference patterns.

Seed laser was broken at 2nd operation week of December.