Plan in summer shutdown

Magnet

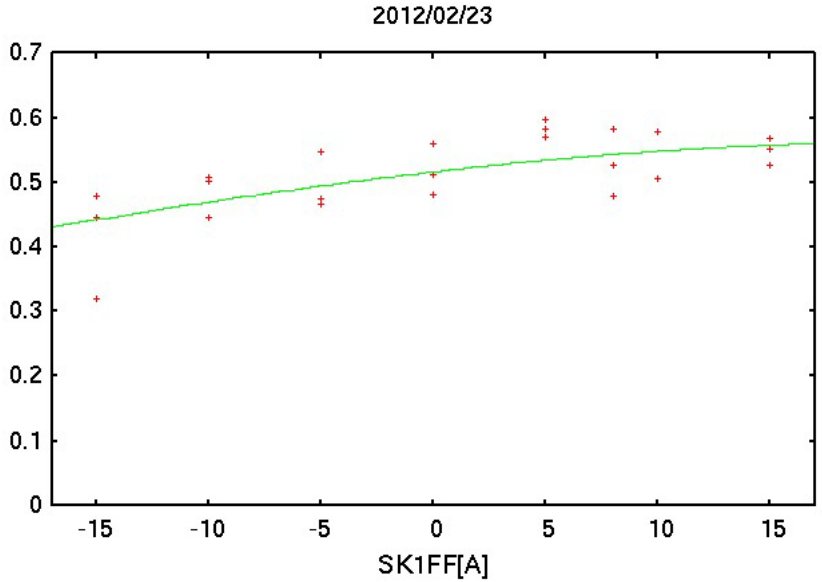
-SF1FF

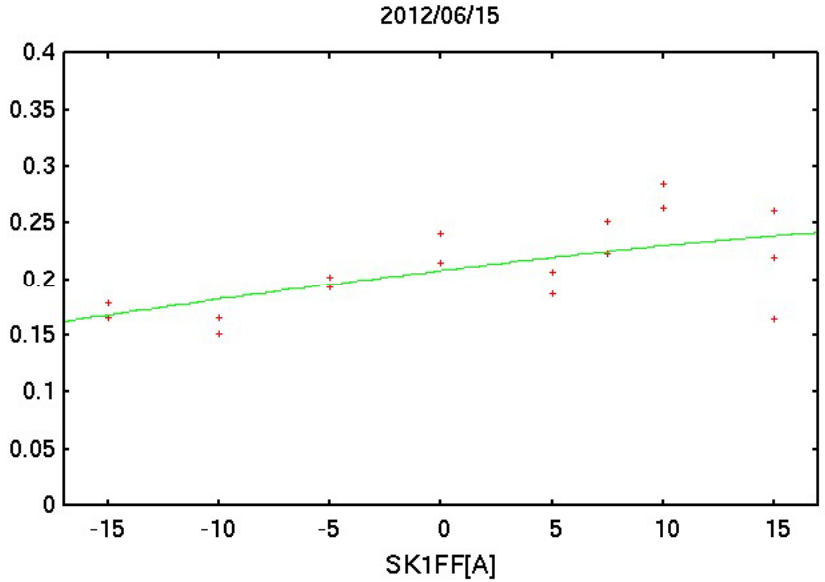
-Swap of QEA magnet

- Multipole field of Final Doublet

IP-BSM improvement

Correction of Skew Sextupole Field





We measured same response of SK1FF strength scan in Feb. and June 2012.

(Minimum SK1FF was around 20A ; design was 5A)

Had we better to replace the SK1FF to stronger one ??

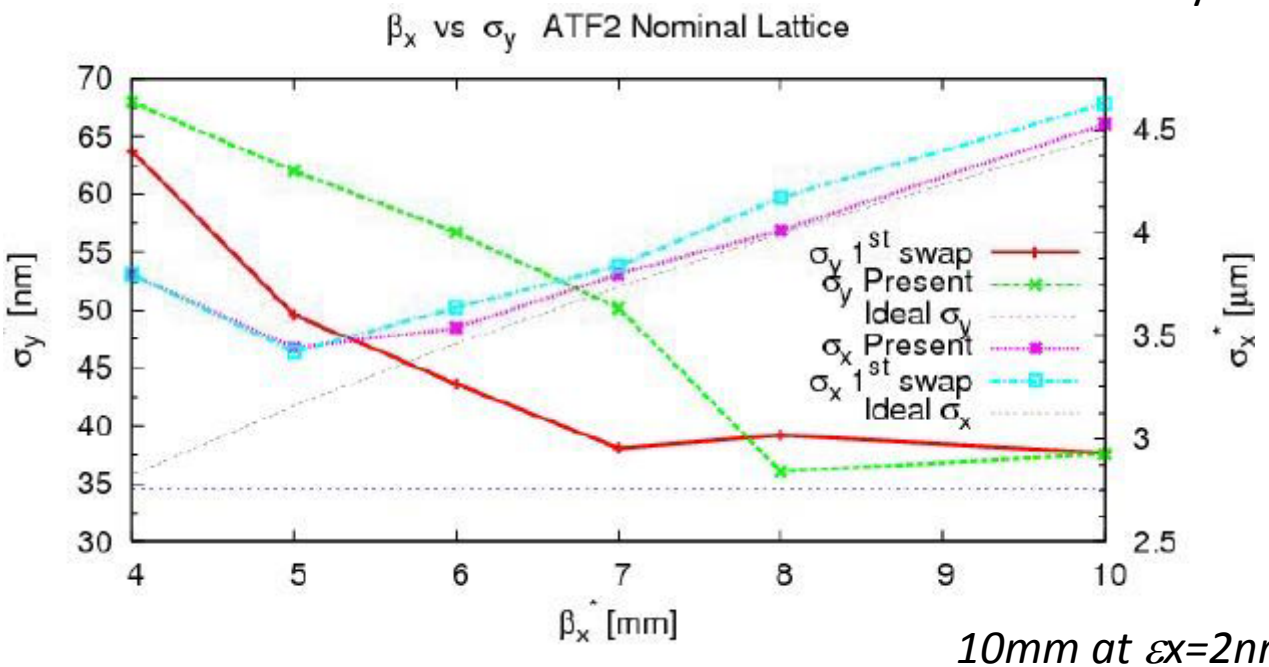
Alignment Tolerance for SK1FF by Edu Marin

$\Delta\sigma = \sqrt{\sigma^2 - \sigma_0^2} = 12nm$ *for 2.5x1 optics*

K = -0.4 m^3	X offset	Y offset	Tilt
5 % $\Delta\sigma_y$	-525 μm	3 mm	400 mrad

QEA Magnet Swapping for ATF2 beamline

by Edu Marin

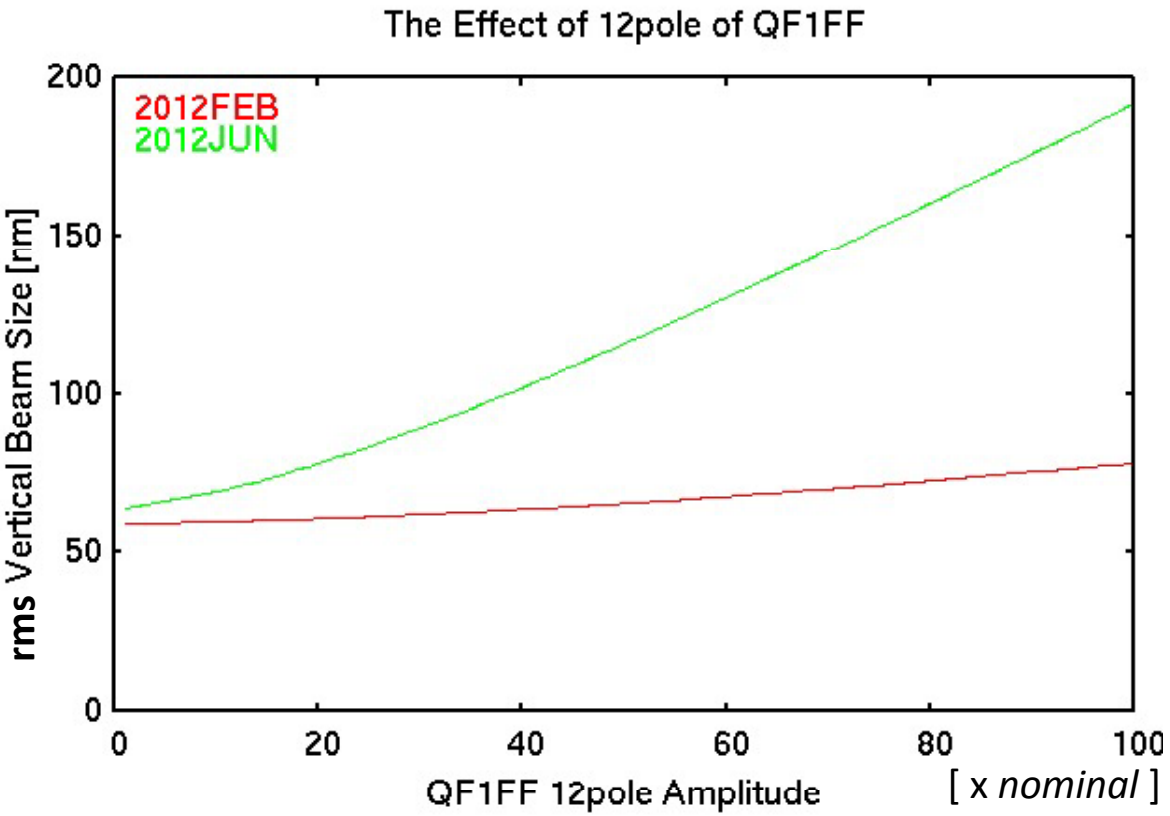


1 SWAP		
QM12FF	-->	QF9BFF
QD2BFF	-->	QF5AFF
QM13FF	-->	QF9AFF
QF19X	-->	QF5BFF
QM15FF	-->	QD4BFF
QD10BFF	-->	QD10AFF
QF17X	-->	QD6FF
QM11FF	-->	QD4AFF
QF7FF	-->	QD8FF

10mm at εx=2nm
15mm at εx=3nm
20mm at εx=4nm
for same beam size at quads

The Effect of Multipole Error

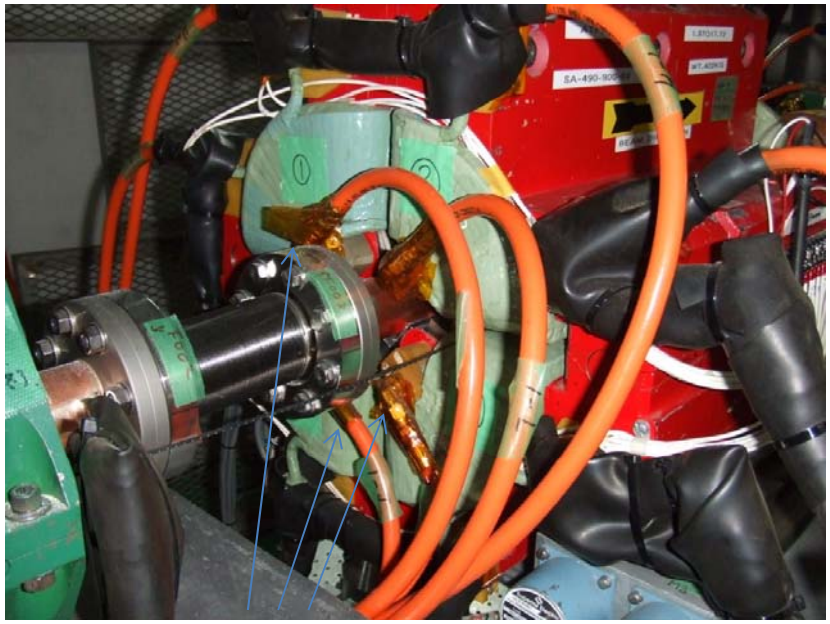
Example ; 12pole of QF1FF



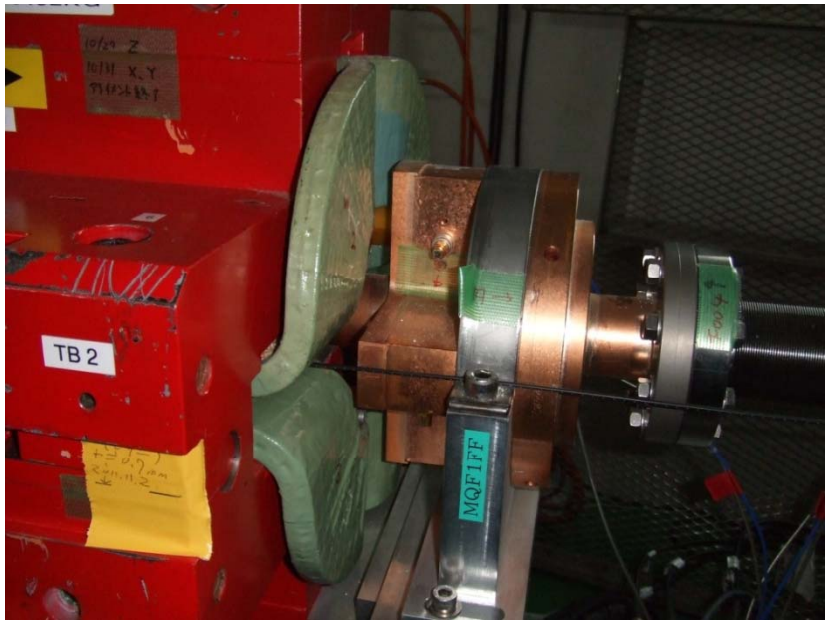
εx=2.0nm, βx=40mm, εy=20pm, βy=0.10mm
56nm rms beam size (44.7nm at linear) at nominal multipole errors

εx=3.0nm, βx=28mm, εy=20pm, βy=0.16mm
65nm rms beam size (56.6nm at linear) at nominal multipole errors

Magnetic Material around Final Doublet



Connector of cooling water (Iron)
Connector of magnet is stainless steel



Feed through of S-band BPM
(Kovar)

	Magnetic Field
QF1FF	*150-200Gauss*
QD0FF	*300-350Gauss*

There is a possibility to make a multipole error for these component.

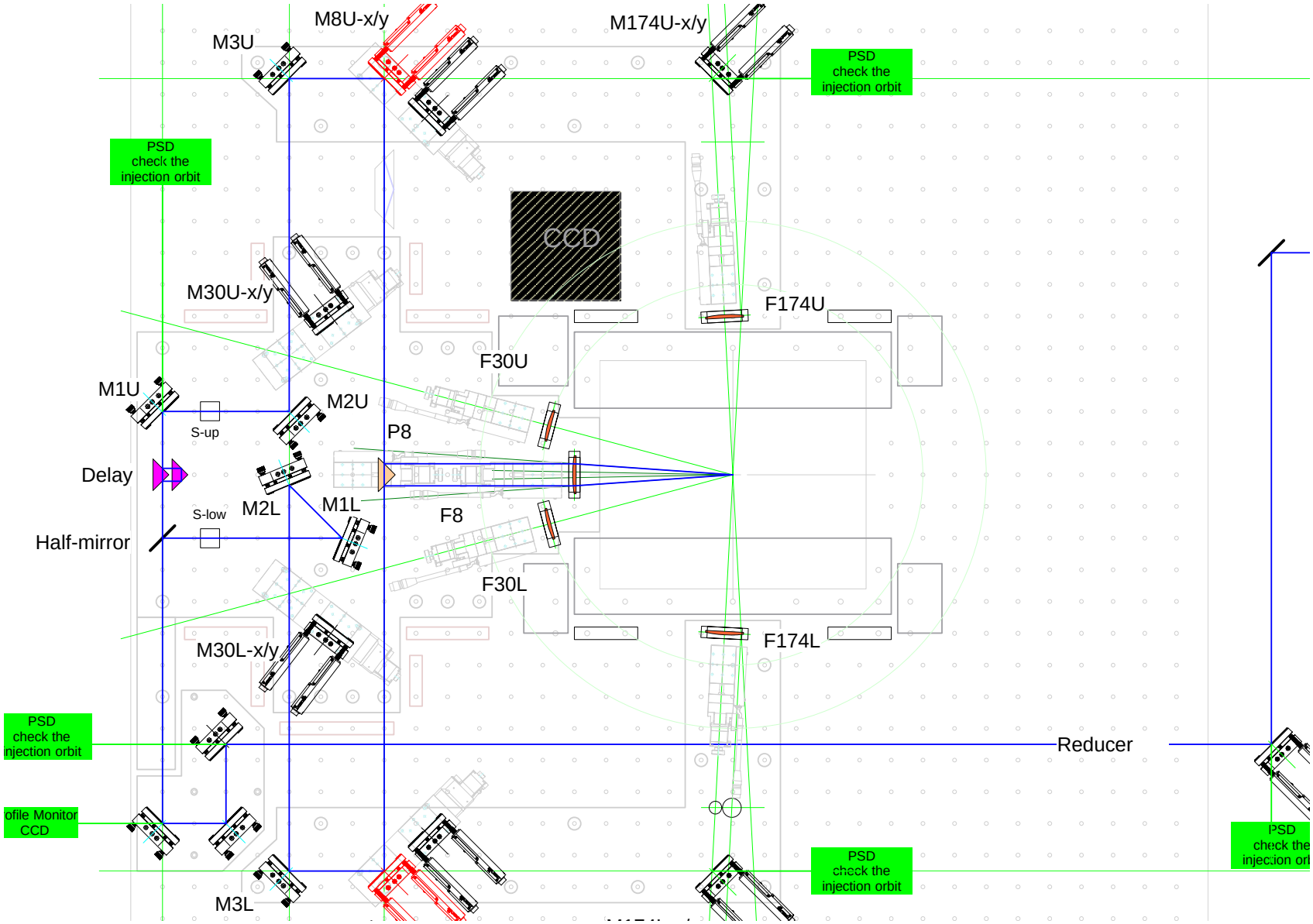
C. Spencer said "magnetic field measurement in SLAC used same connector for cooling water." But, maybe not put the S-band BPM for the magnetic field measurement.

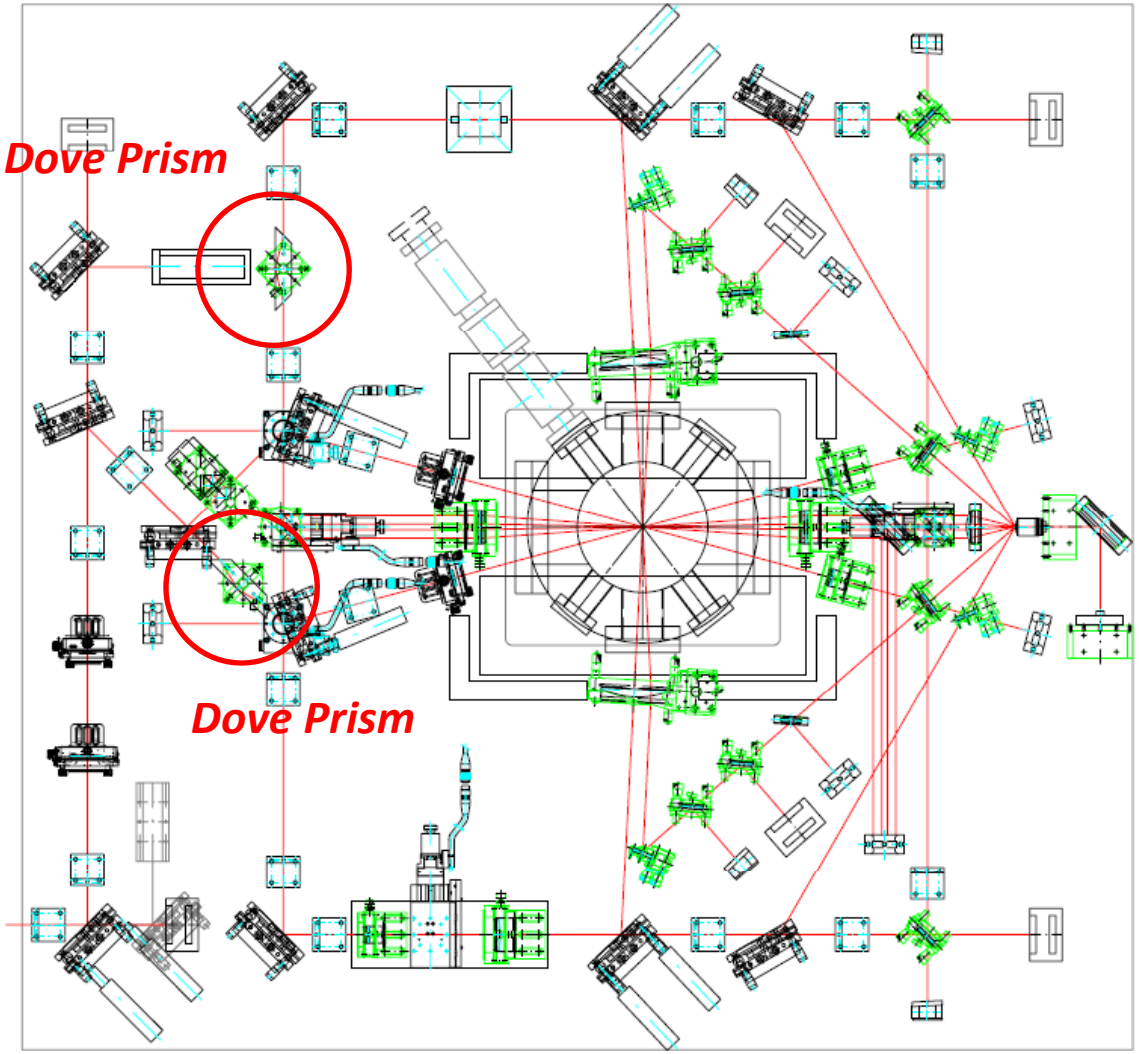
Difficulties	Solutions
Reproducibility of a laser path: A Laser is not well adjusted to the design path because there is no reference to guide it. A laser travels 10cm high from the vertical table. Non-negligible mismatch toward the IP happens very often after the adjustment of the laser orbit.	**Well defined references near the optical elements:** Put reference lines on the base plates, pedestals etc., to enable the alignment of optical element and traveling laser.
Significant spot size difference at IP between upper and lower lasers. Path length is not same because of the chicane for fringe phase control. It introduces the different waist position; i.e., no ideal crossing.	**Match the path length of upper and lower lasers.** It will be done by adding a drift space that created by an image flopping mirrors.
Concern on the small beam tuning: Changing the crossing angle was done by two sets of rotatable stage and mirror on it. Searching a beam (laser wire, z scan) is done by adjusting the angle of this mirror. Sharing this mirror for different crossing mode lead a retuning every time because it was changed during the previous mode.	**Change the crossing-angle handling concept.** • Remove the rotator and introduce a mirror on a linear mover to select the crossing mode. • Independent mirror adjustment for each crossing mode. • Fixed reducer setting.
	• Introduce focal lens movers.

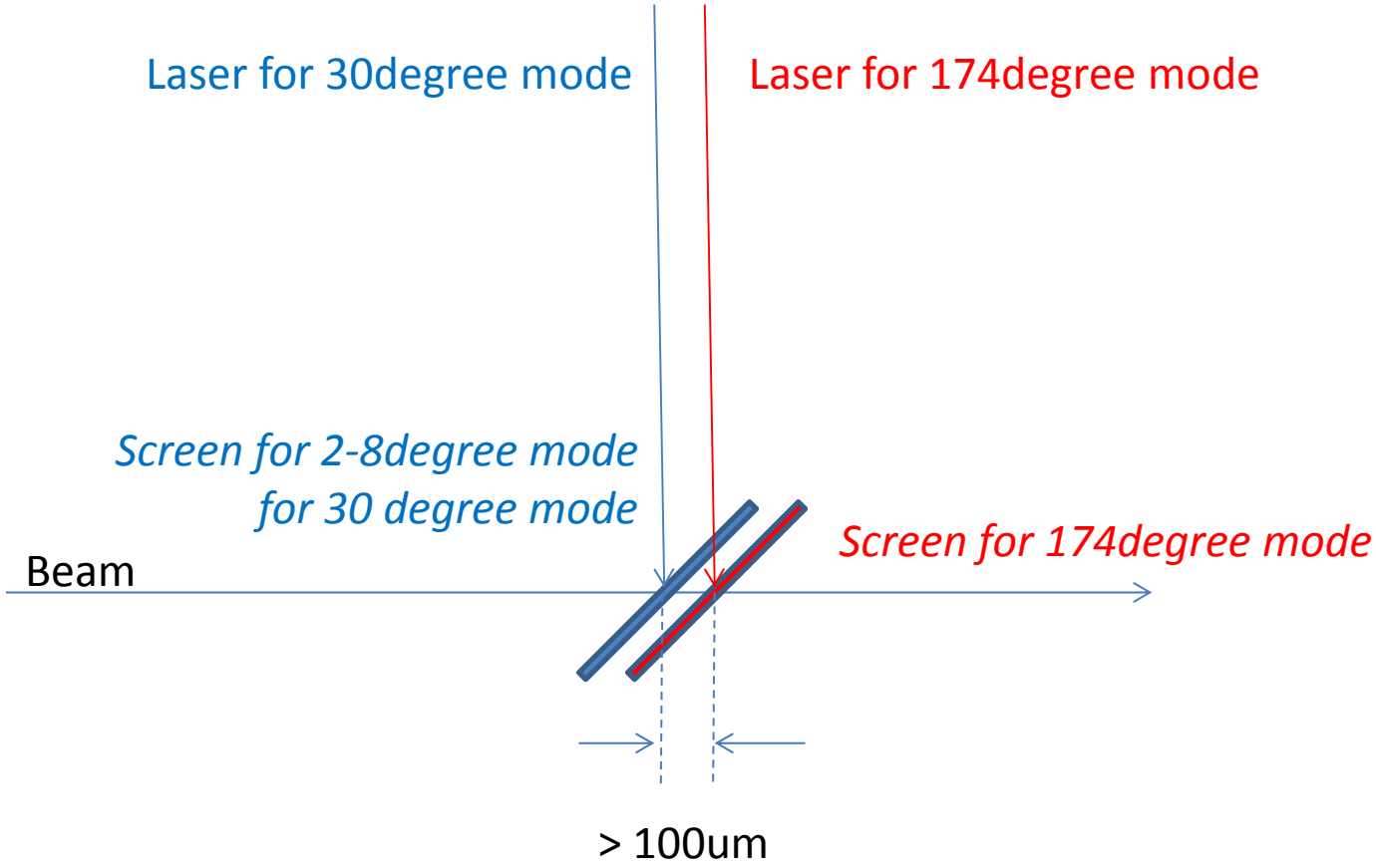
Other problems of IP-BSM

Most of the problems were already presented yesterday,
and we will discuss in tomorrow discussion session

1. Alignment of optical components on the vertical table are different from the design.
   - Laser injection angle is different from 2-8degree mode and 30degree mode.
   - When the rotator is rotated, the laser position at the mirror on the rotator is change.
   - Upper path for 174degree mode is not seen in the screen of 2-30degree mode.
   (no reference line to put the optical components)
2. The focal points for upper path and lower path are different.
3. The collision angle is different from design.
   - Laser is not on the center of lens for 30degree mode.
4. The laser paths for lower angle mode are not kept in higher angle mode measurement.
5. Rotator move unexpected direction sometimes.
6. The effect of Dove Prism
   - If the injected laser has divergence, the focal point is shifted.
   - If the injected laser has angle, the image is rotated.
   - The reduction of maximum modulation


M3U
M8U-x/y
M174U-x/y
PSD
check the
injection orbit
PSD
check the
injection orbit
CCD
M30U-x/y
F174U
F30U
M1U
M2U
S-up
P8
Delay
M2L
M1L
F8
S-low
Half-mirror
F30L
F174L
M30L-x/y
PSD
check the
injection orbit
Reducer
ofile Monitor
CCD
PSD
check the
injection orbit
M3L
PSD
check the
injection orbit


Dove Prism
Dove Prism



We can not see every laser paths with same screen.

Therefore, we prepare to 2 screens (for 2-30degree mode and 174degree mode)

Upper path for 174 degree mode is design to see 30 degree mode screen