

IPBSM: hardware upgrade and future plan

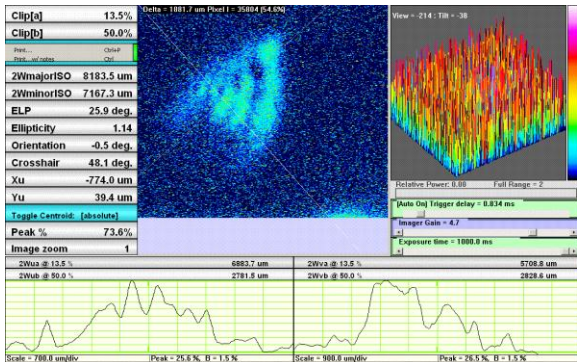
2012/06/27

Masahiro Oroku

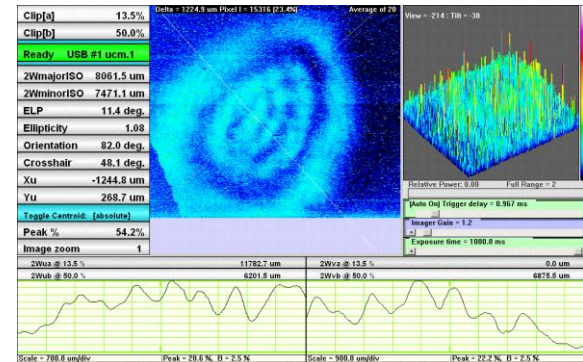
Hardware upgrades from January

- Implement of laser position stabilization system (Spectra Physics)
- Improvement of laser profile
- Seeder stabilization (Spectra Physics)
- New setup of the reducer
- Additional mirrors to make optics easy
- Avoid plasma breakdown between reducer lenses

Improvement of laser profile



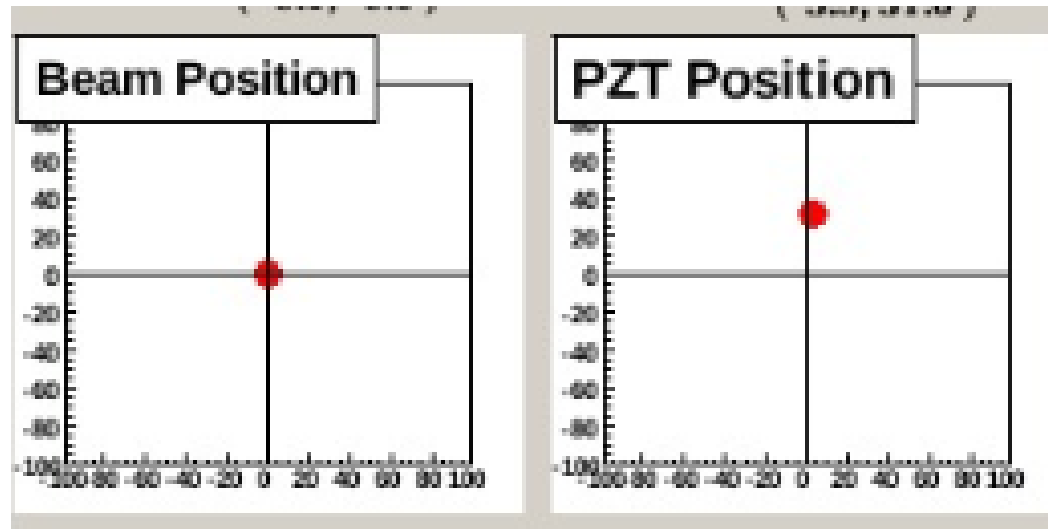
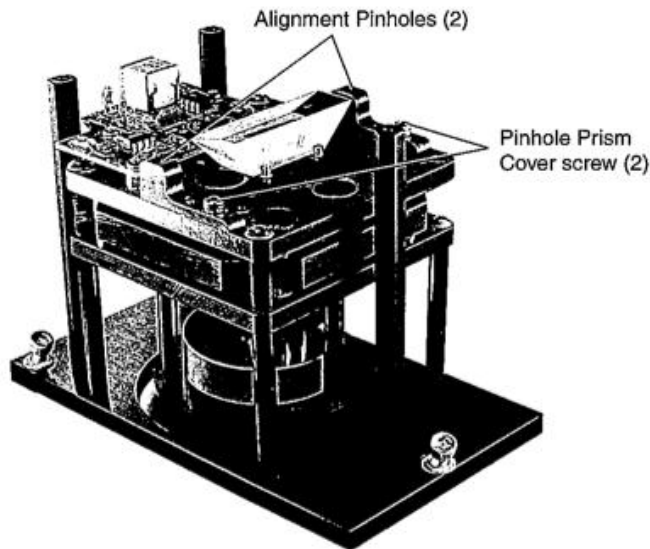
Before
improvement



After
improvement

- Mar 27th
- Rear mirror of oscillator was exchanged

Beamlock system (Spectra Physics)

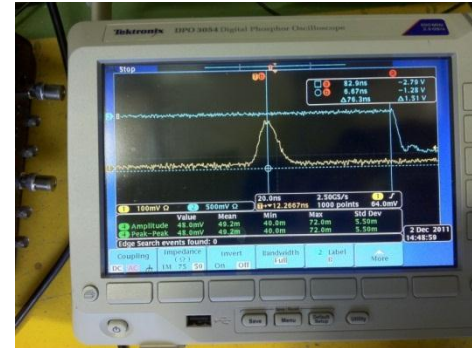


- ~ Feb
- Position stabilization system using piezo feedback
- Monitored through “Laser Status” window

Seeder stabilization

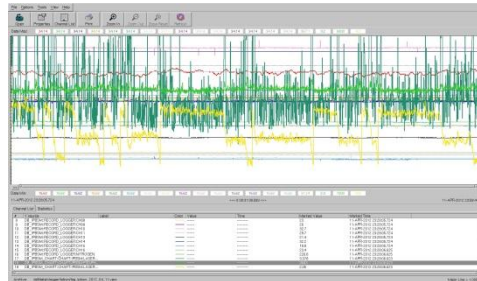


Without seed laser

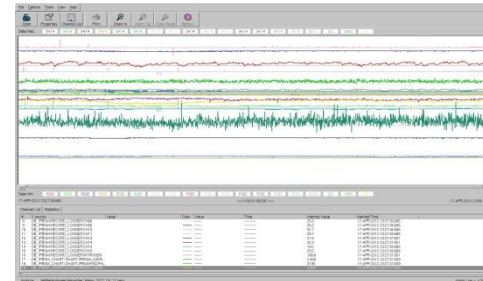


With seed laser

Green : BUT
Yellow : Piezo
of oscillator



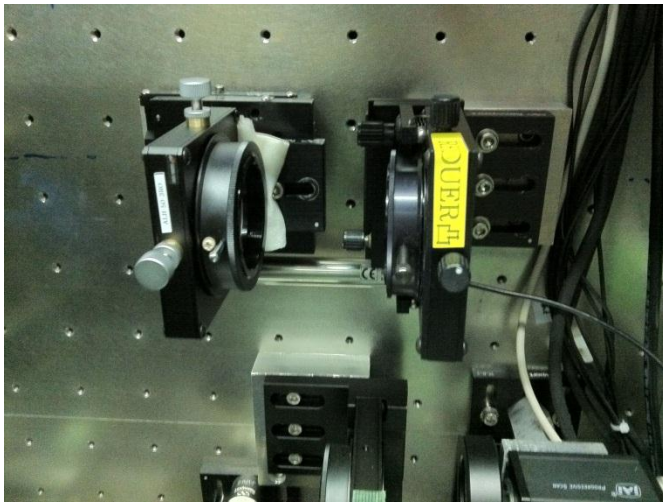
Before
stabilization



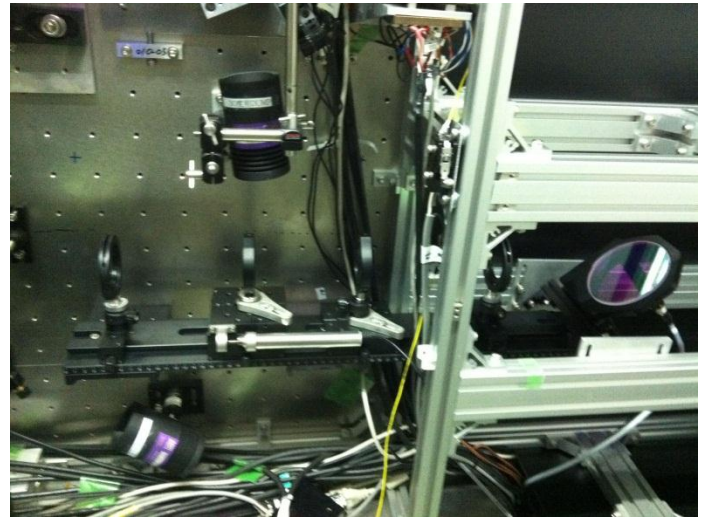
After
stabilization

- Apr 19th
- Seeding laser was swapped to new model

New setup of the reducer



Old



New

- Apr ~ May
- Lenses were set to the same rail
- Irises were set before / after the reducer

Avoid plasma breakdown between lenses



- ~ May 9th
- Between reducer lenses
- cause is lack of AR coating
- Lenses are now AR coated

Current problems & plans

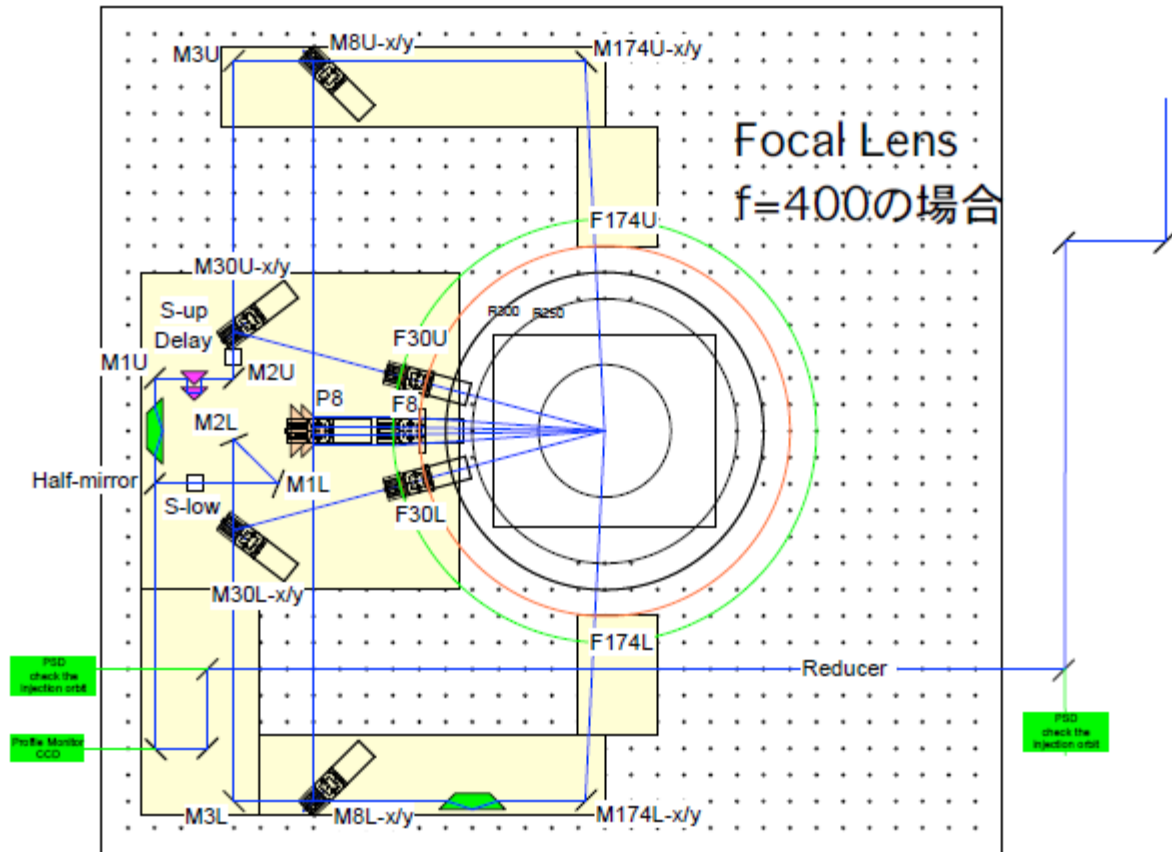
Problems & discussions

- Difficulty of making optics : no reference lines
- Rotation stage to switch angles is broken
- Is dove prism necessary?
- Systematic error evaluation
- Laser wire scan 2-peak profile
- TDC & Scan ADC broken (maybe)

Plans

- Implementation of alignment laser
- Laser power stabilization (swap to new model)
- New optics on the vertical table

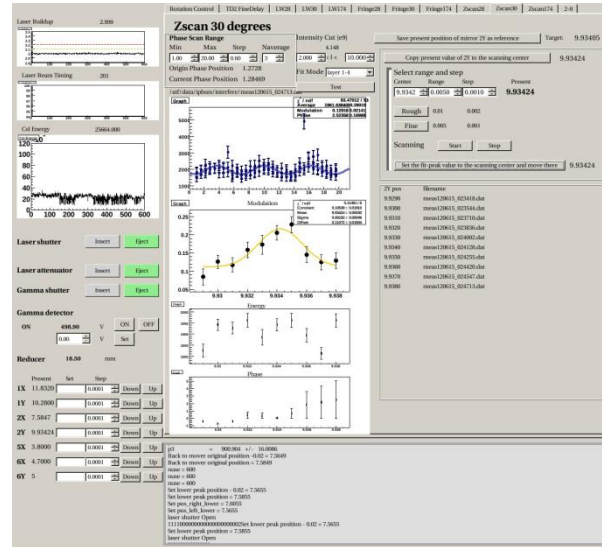
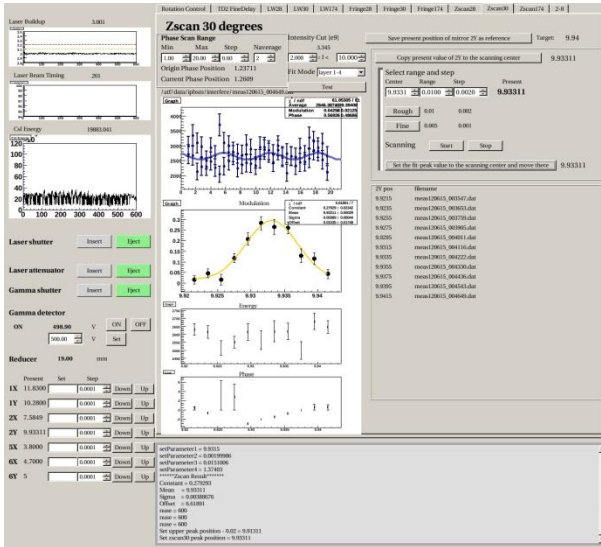
New optics on the vertical table



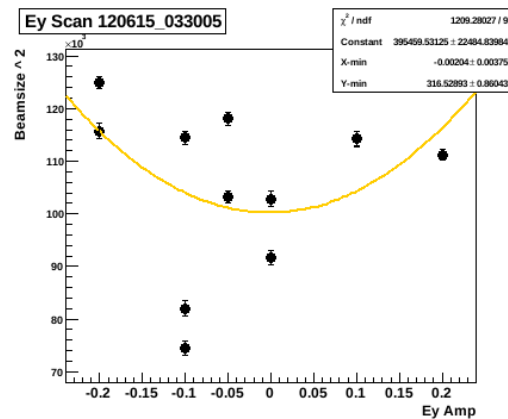
- Details will be presented from Terunuma-san

Backup

Reproducibility of measurement



Z-scan profile
changed in
2 hours
(6/ 15 owl shift)



Multi knob scan
(6/ 15 owl shift)

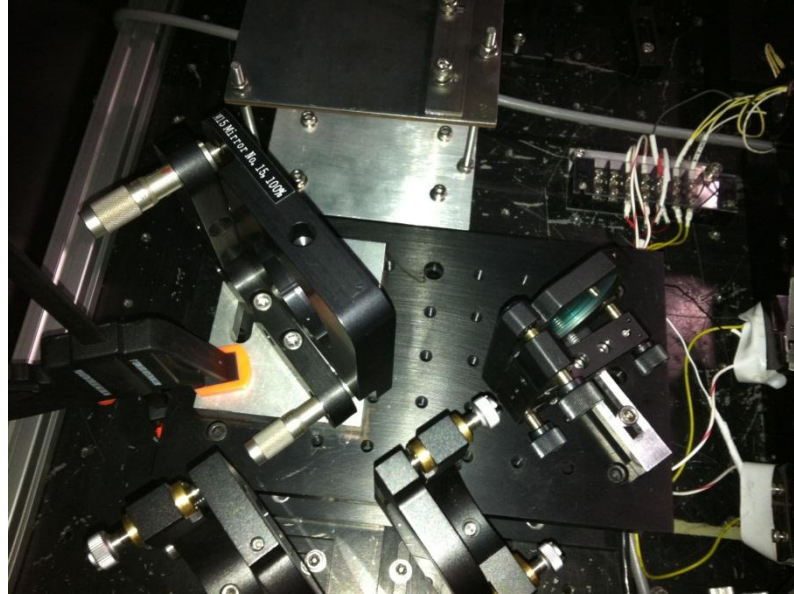
Current problems & plans

- Problems & discussions
- Reproducibility of beam size measurement
- Reliability of the optics system
- Difficulty of making optics : no reference lines
- Rotation stage to switch angles is broken
- Is dove prism necessary?
- Implementation of alignment laser
- Systematic error evaluation
- Laser wire scan 2-peak profile
- Laser power stabilization
- TDC, Scan ADC ..

Reliability of the optics system

- Difficulty of making optics : no reference lines
- Rotation stage to switch angles is broken
- Is dove prism necessary?
- Implementation of alignment laser

Laser table



Laser wire scan 2-peak profile