Status of Existing Instruments
Subaru Users' Meeting 2012

Hiroshi TERADA

(Science Operation Division)

Highlight (2012)

Instruments Lineup and Events

2012 Aug

HSC commissioning starts.

✓ *Further testing scheduled.*

2012 Sep

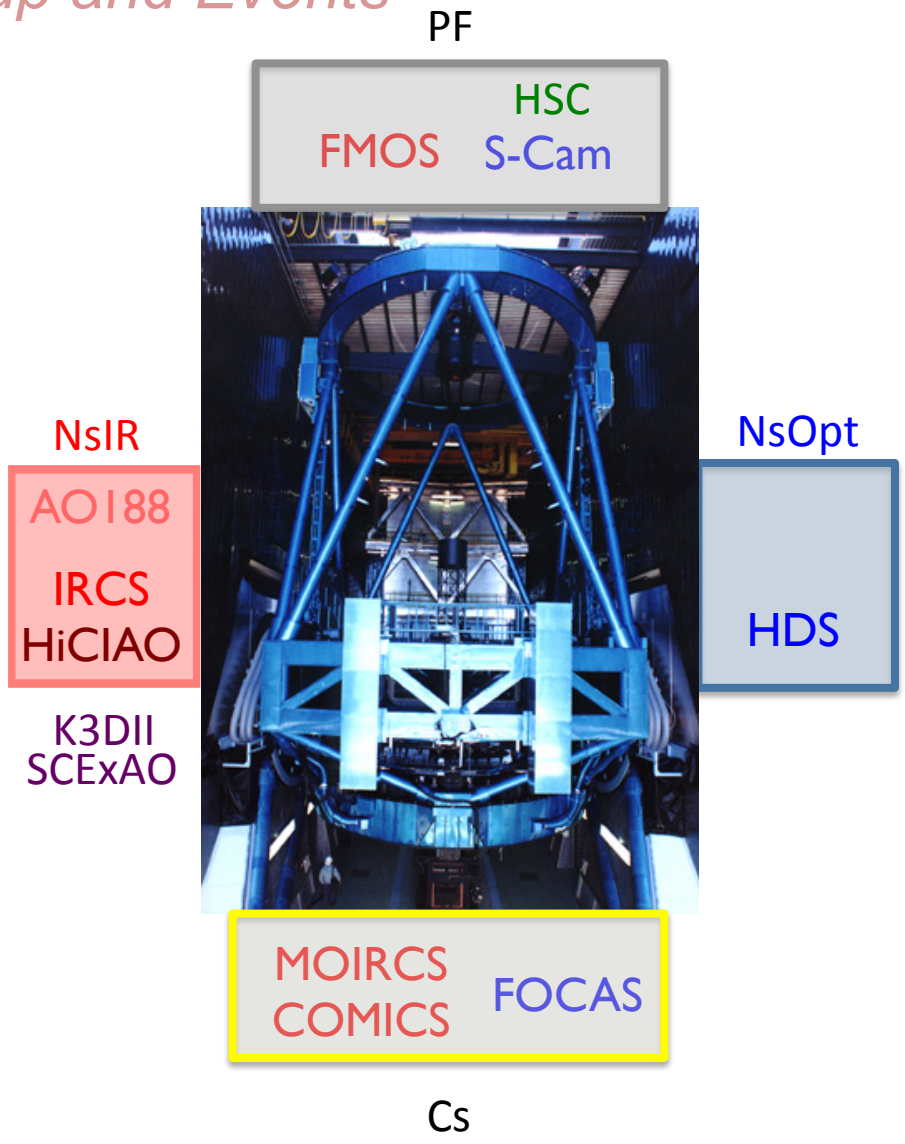
TU Trouble happened.

✓ *Limited instrument choice (~Dec)*

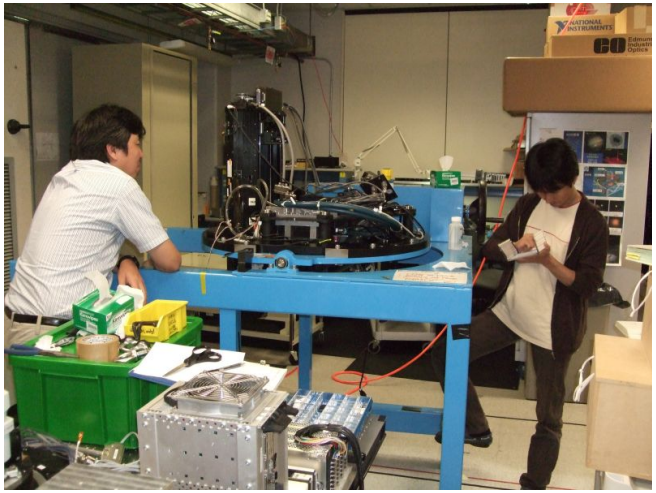
Almost Completed

Recovery from Glycol Incident

- Cs ADC still to be installed
- *M1-recoating should recover the full capabilities for all the instrument..*



Suprime-Cam
(recovery from glycol incident)



Disassembling Suprime-Cam (2011/7/15)

Preparation for observation (2012/7/11)

2012/4 Filter exchanger and shutter is repaired
2012/4/27 Re-assembly of all parts
2012/6/18 Transfer to the summit
2012/7/15 Restart open use observation

Suprime-Cam
(Current Limitation)

Unstability of the filter exchanger system

When we exchange filters,

- ✓ the filter sometimes stacks.
- ✓ the barcode of filter sometimes is not acknowledged.

Now investigating about these problems.

Remote observation will be restarted

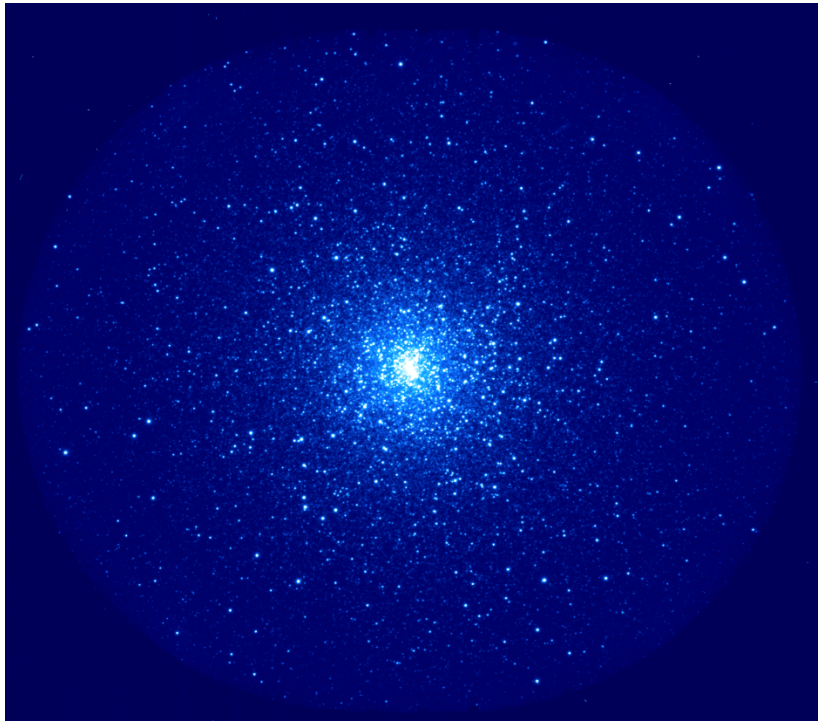
after confirmation of the stability of the filter exchanger.

FOCAS
(recovery from glycol incident)

Sep. 2012 : transport to the summit

Oct.-Nov. 2012 : test/open-use observations with IRM2

Dec. 2012 : test/open-use observations with CsOpt

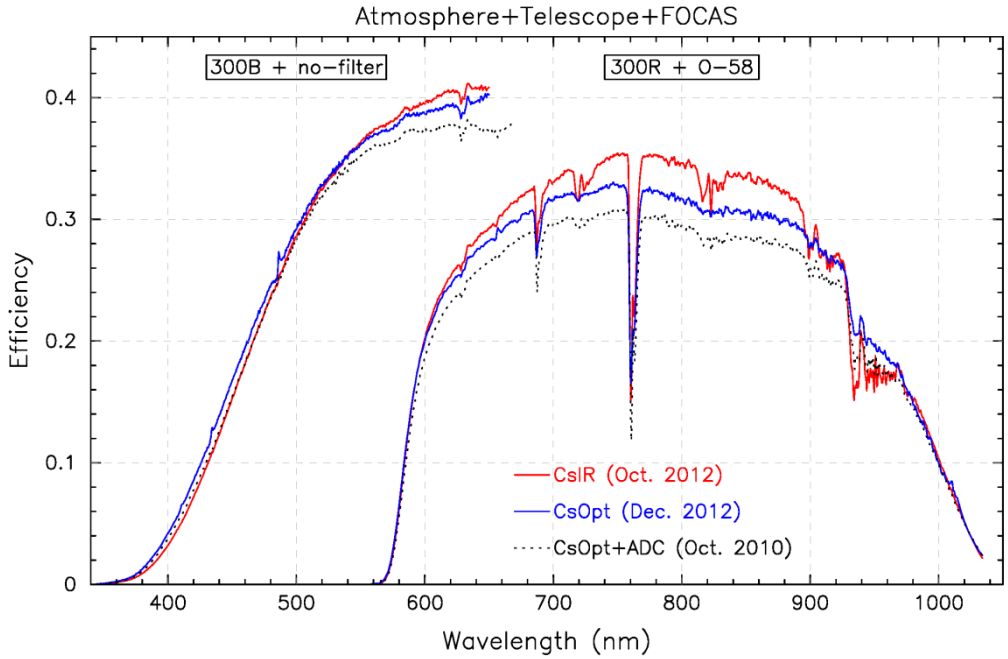


M15 (IRM2, R-band, seeing 0”.55)

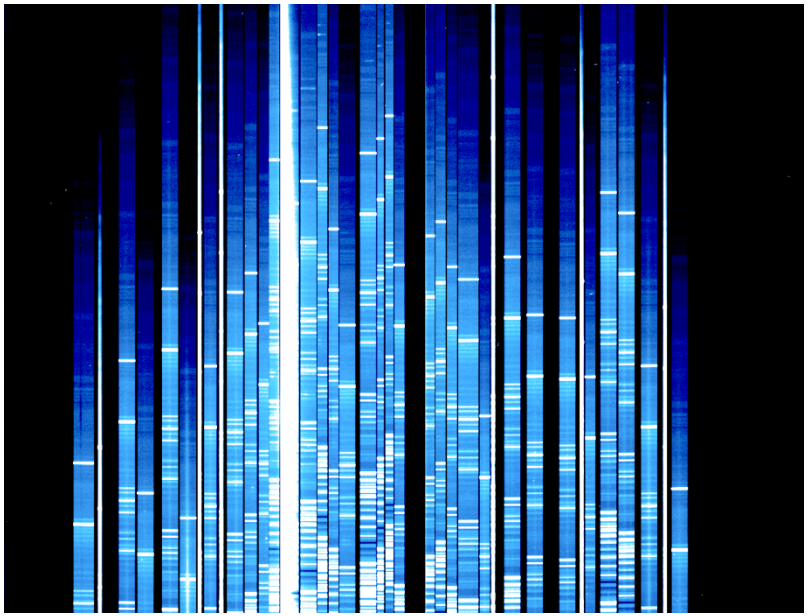
FOCAS
(recovery from glycol incident)

Test observations have been mostly successful

- ✓ similar imaging/spectroscopic performance as before
- ✓ multi-object spectroscopy
- ✓ polarimetry



System efficiency with 300B/R grism



MOS observation of Mrk 6 field

FOCAS

(Current Limitations)

Atmospheric Dispersion Corrector for Cs.

- currently under repair
- not available for S12B/S13A
- will be installed in Aug. 2013

FOCAS observation with IRM2

- ready for operation including MOS observation
- but with several drawbacks compared to CsOpt
  - higher background (20-30%)
    - due to stray light from the side of IRM2
  - Fresnel diffraction (see poster by Tanaka-san)
    - similar reason as above
    - when there is a bright star(s) at ~1.25 degree from the FoV
  - non-uniform sky-background and domeflat
  - Atmospheric Dispersion Corrector cannot be used with IRM2

FMOS (Status and Plan)

Full Function (IRS1 & 2 w/LR & HR) available

- ✓ Several nights only with one spectrograph due to warmup of another spectrograph (failures of watching chillers).
- ✓ Replacement of IRS1 OH mask mirror (2012 summer)
- ✓ IRS1 J-band mask mirror to be adjusted by ~0.52 mm
- ✓ New Spine-to-Object software was released (2012 Dec)

Dr. Josh Walawender

(for instrument maintenance)

MOIRCS (Troubles)

Turret Troubles happened (again) in Sep 2012…

Date	Obs	Events
Sep 29,2012	S12B026	Trouble Happened. **Channel-1 Turret got stuck.**
Sep 30 – Oct 1	S12B026, S12B008	Ch2-only operation.
Oct 2	S12B008	We succeeded to put ch1 to HK500 position. Decided not to move further.
Oct-Dec		**Ch1 has been used only for HK500 spectroscopy.**
Jan 4, 2013	S12B-036	**Channel-2 Turret Trouble has happened.** A night loss.
Jan 7~		Troubleshooting is ongoing. T5 turret has difficulty in moving counterclockwise, resulting in the loss of current position. **For clockwise move it is okay for now.**

Fixing work planned in Feb-Mar 2013.

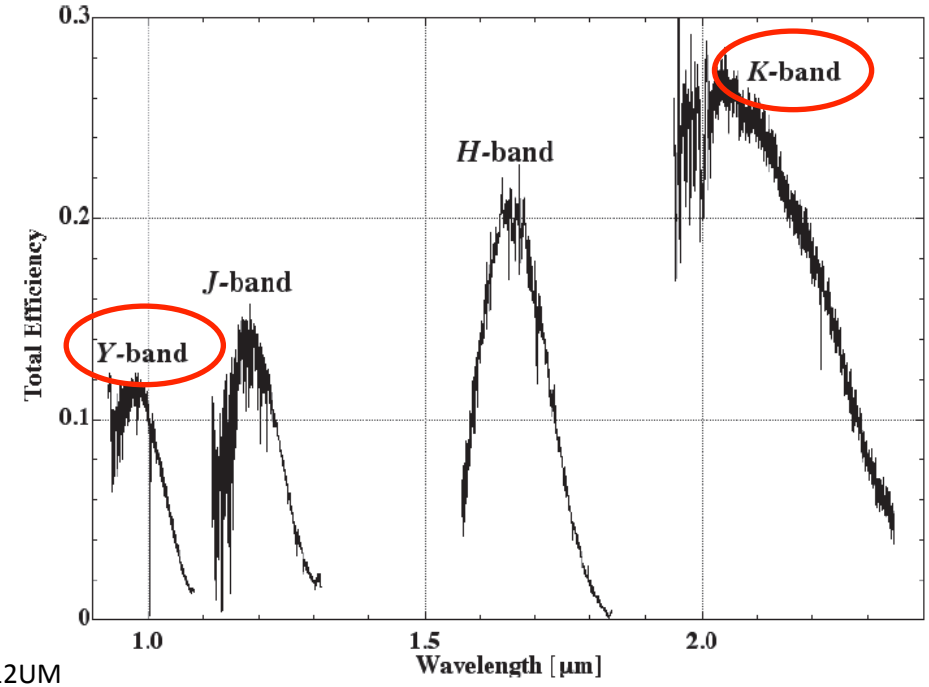
MOIRCS (New capabilities)

New features available for Service Mode (S13A~)

- NB filters & More flexible operation (such as Sky Nodding)

New Filters/Grisms available for Open Use(*1).

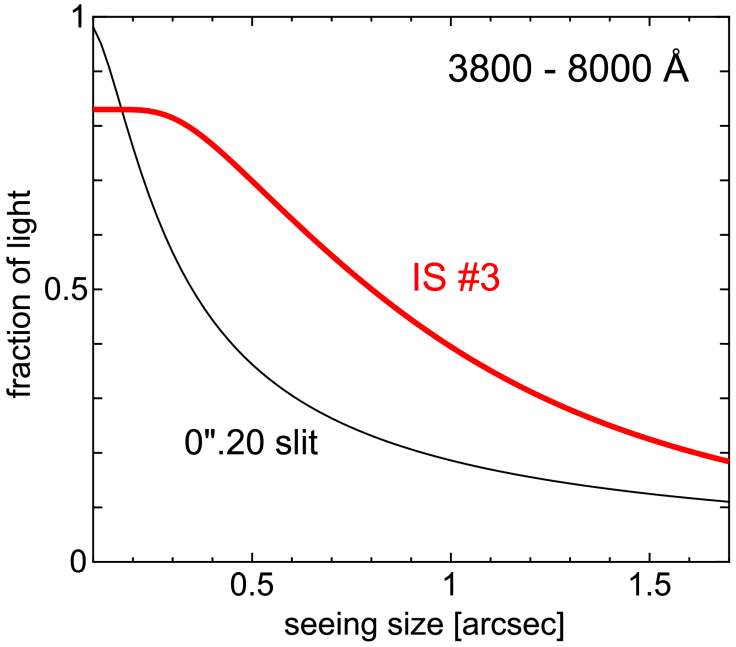
- Three new narrowband filters (NB2315, NB2071, NB1657)
- Two VPH grisms (Y and K: R~3000)



*1: Special Thanks to
Dr. T. Kodama (NBs),
Dr. K. Shimasaku, and
Dr. T. Yamada (VPH) for providing with the carry-in filters and grisms.

HDS (Upgrades)

Image Slicer #3



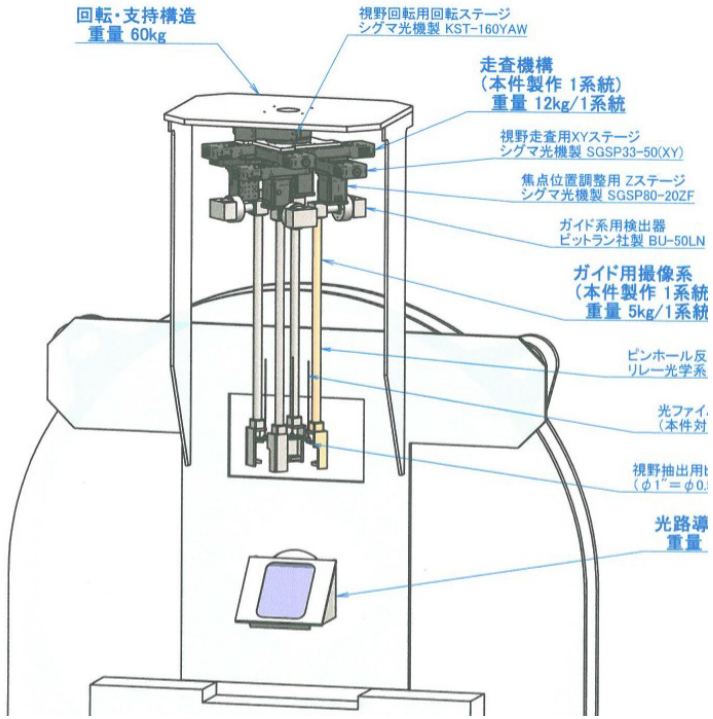
- ✓ R=150,000 will be achieved
  w/ 0”.2 x 3 slits
- ✓ *2 times higher efficiency!*

⇒ *Please see Tajitsu+2012 (PASJ, 64,77) for #1 and #2 performance..*

Multi-object (fiber) Unit

by W. Aoki-san+ Grant-in-Aid

✓Up to 4 Units



IRCS (overhaul and new capabilities)

Period: 2013 Jun to Aug (overrapped by M1-recoating)

- First time opening up the dewar after moving on NsIR (2005 Dec)
- Extensive check will be conducted..

New modes will be installed

- ✓ Two NBFs (1.551um, 2.323um) and one BBF (Y-band)
- ✓ Replacing JH Low-res grism -> zJH Low-res grism
- ✓ Polarization function (Wollaston prism)
- ✓ Three NBFs for order-sort in Echelle
  (1.085um, 1.256um, and 1.650um)

Measured emissivity and throughput of AO188 (2012 Nov)

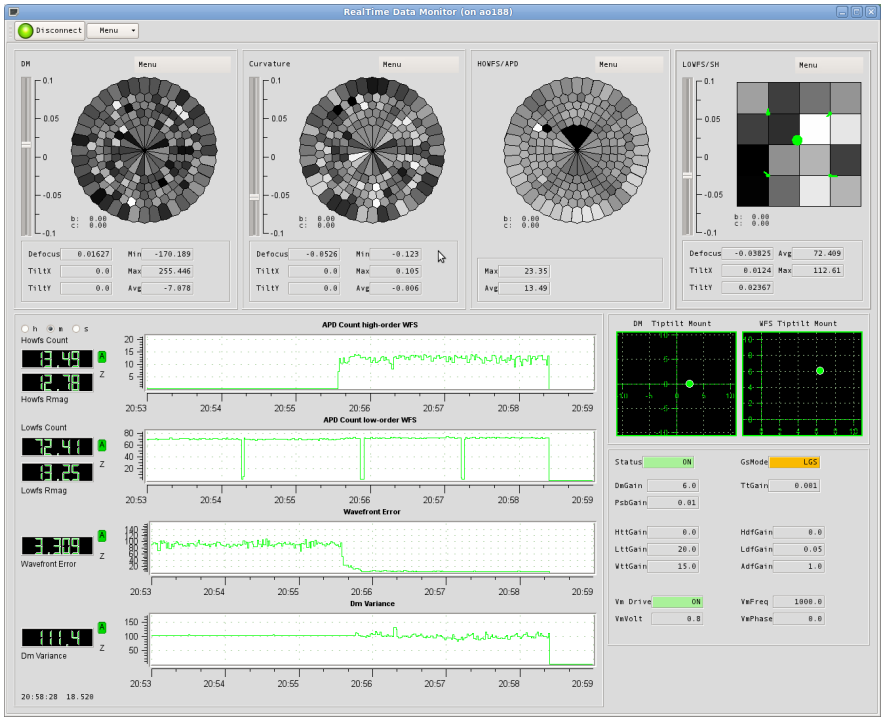
for evaluating value of "IRCS direct" mode

AO188 (status)

AO188 (NGS & LGS) Fully Commissioned

- ✓ Stably operated with IRCS and HiCIAO (incl. w/LGS)
- ✓ Combination tested w/ SCExAO and K3DII

Refining Operation



- ✓ Summarize AO status (such as loop parameters)
- ✓ Refresh status in about 10 Hz
- ✓ Easy to recognize temporal change in AO performance

AO188 (operation refinement)

Improved procedures for LGS initial calibration

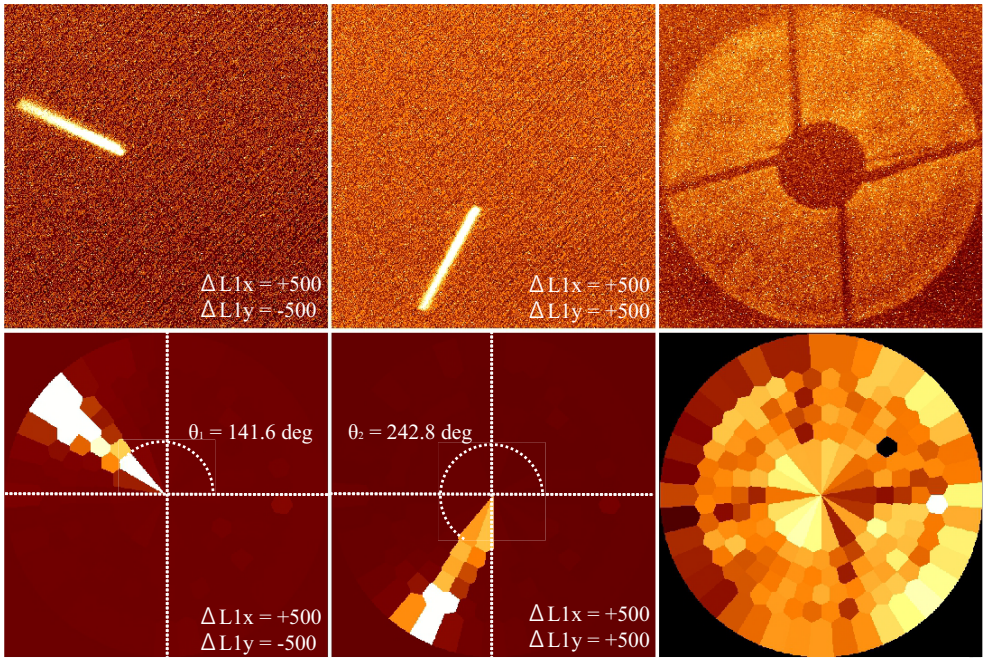
(laser beam tilt and collimation alignment)

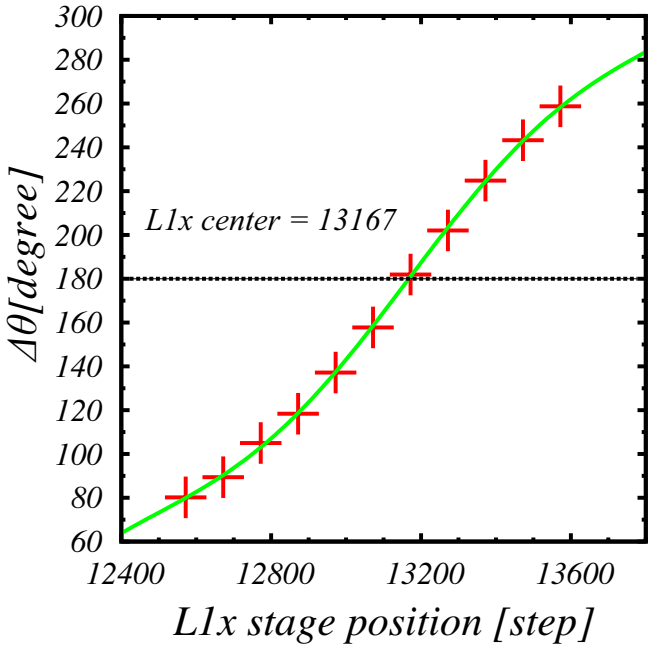
- ✓ Previously large overhead (> 30min)

  depending on the skill of the operator.

- ✓ **New procedures: less overhead (~15min) fully automated.**

LGS beam alignment procedure





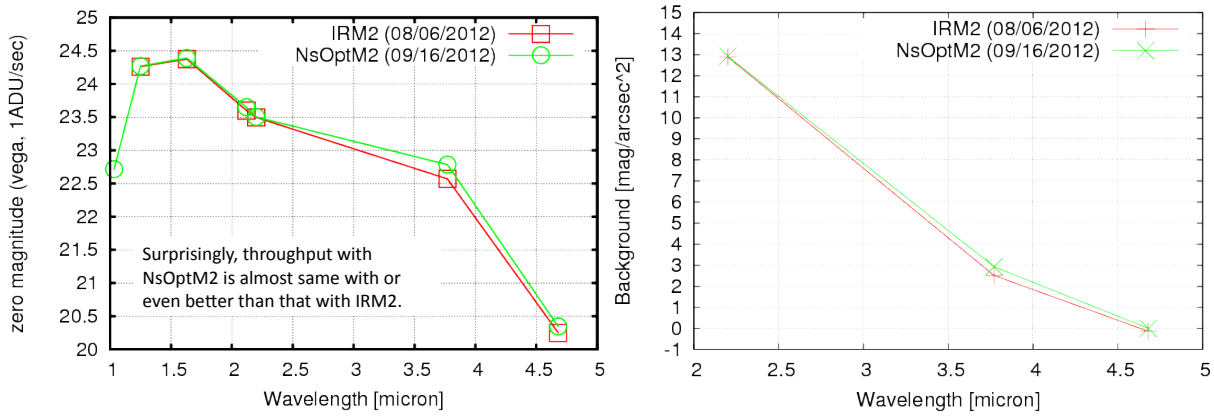
AO188 (flexible operations)

Tested NsOpt and CsOpt M2 availability for

- avoiding stray light due to the diffraction by the edge of IR M2.
  (see M. Tanaka+ Poster)
- enabling more flexible scheduling by reducing the number of M2 exchange.

NsOpt M2 available

- ✓ No degradation found for throughput and emissivity at 0.4 – 5.3 micron
- ✓ Note that plate scale becomes about 5% larger



CsOpt M2 (currently) not available

due to limitations in the secondary control unit.

Summary

Recovery from the Glycol Incident

Suprime-Cam: Successfully done!

FOCAS: Successfully done!, but still ADC to be installed.

MOIRCS

- *Channel-1 trouble (and Channel-2 concern)*
- New NBFs & VPH-grisms, and New mode open for Service obs.

HDS: Image-slicer and Multi-object fiber upgrades

IRCS: ***Overhaul (2013 Summer)*** and new functions to be introdued.

AO188: *Fully commissioned* and *Operation refinements*

FMOS: *IRS1 OH mask mirror to be adjusted.*

COMICS: Clearer background subtraction expected after M1-recoating in 2013 Summer