Status of Existing Instruments
Subaru Users' Meeting 2010

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(Science Operation Division)

Highlight (2010-2011)

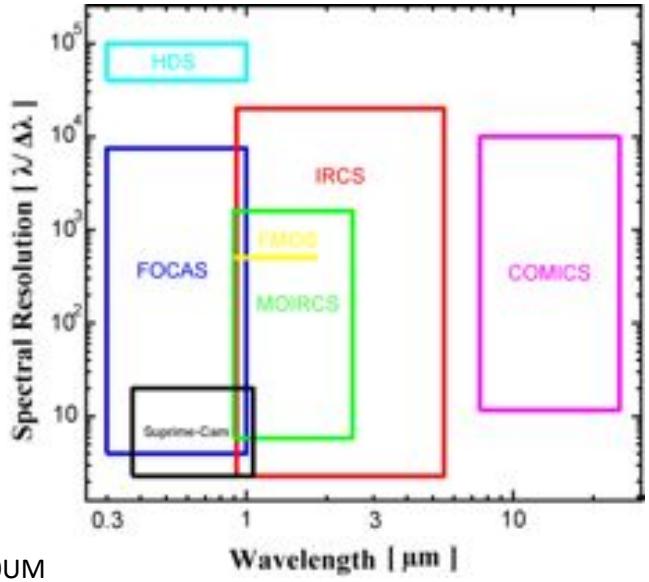
Instruments Lineup

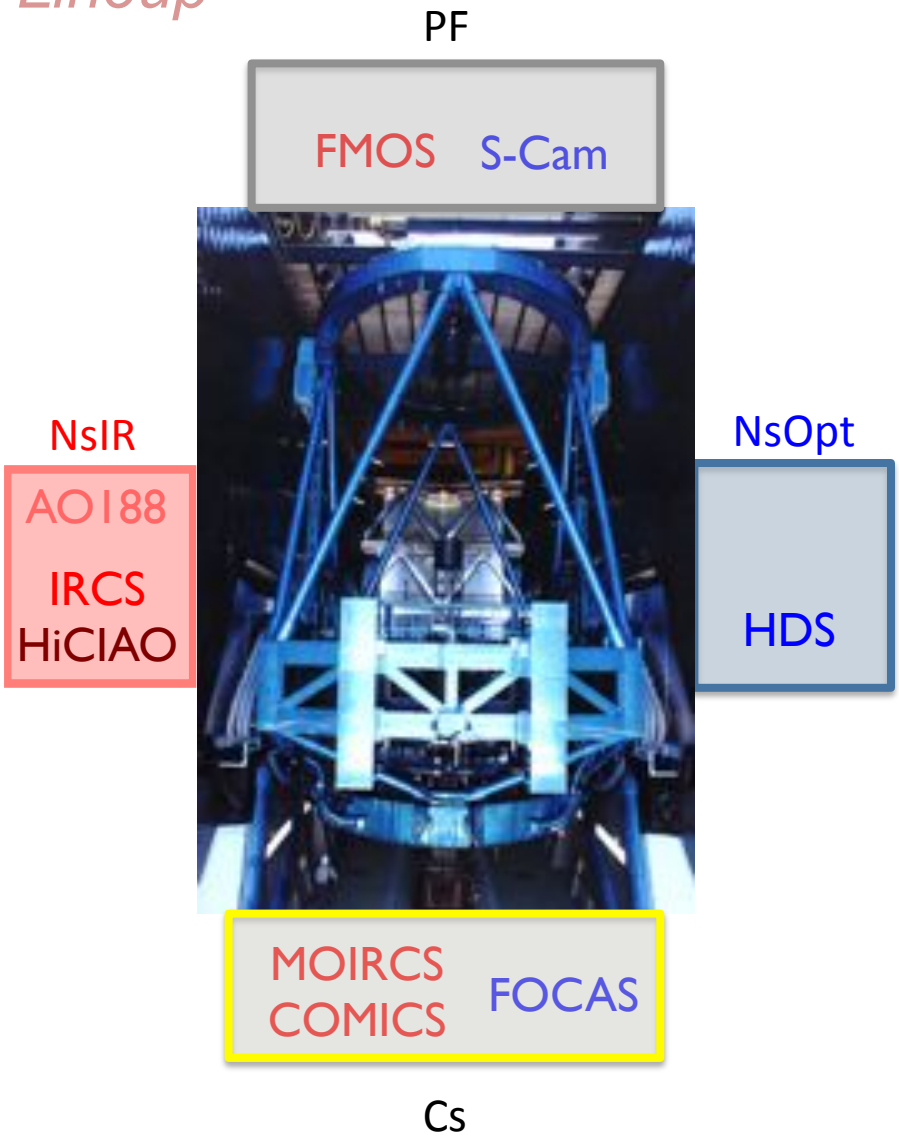
2010 June

- *FMOS joined in the lineup*
  - ✓ *IRS1 low-resolution only*
  - ✓ *IRS2 will come in S11A.*

2011 May

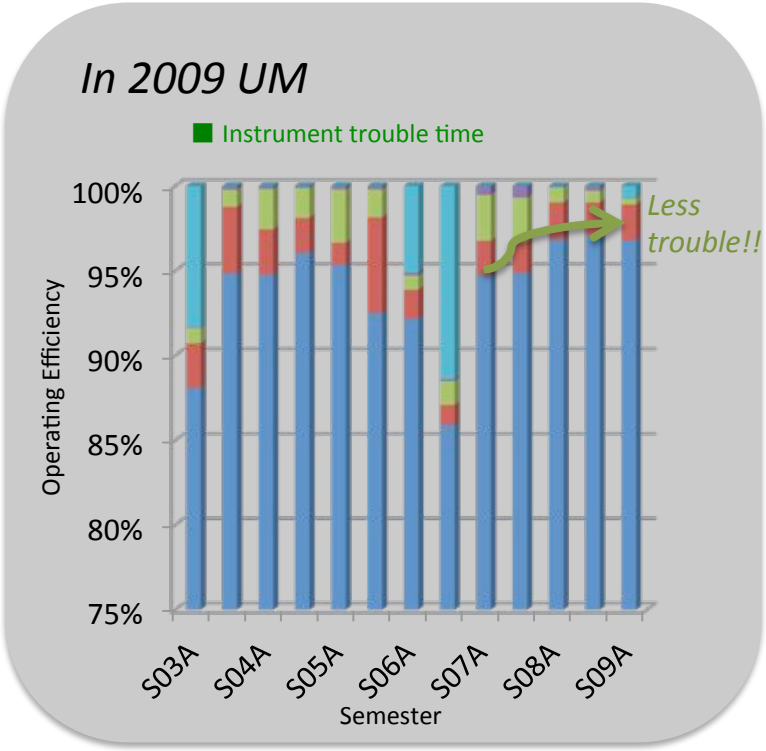
- *LGS AO188 will start open use.*
  - ✓ *Evaluation on-going*

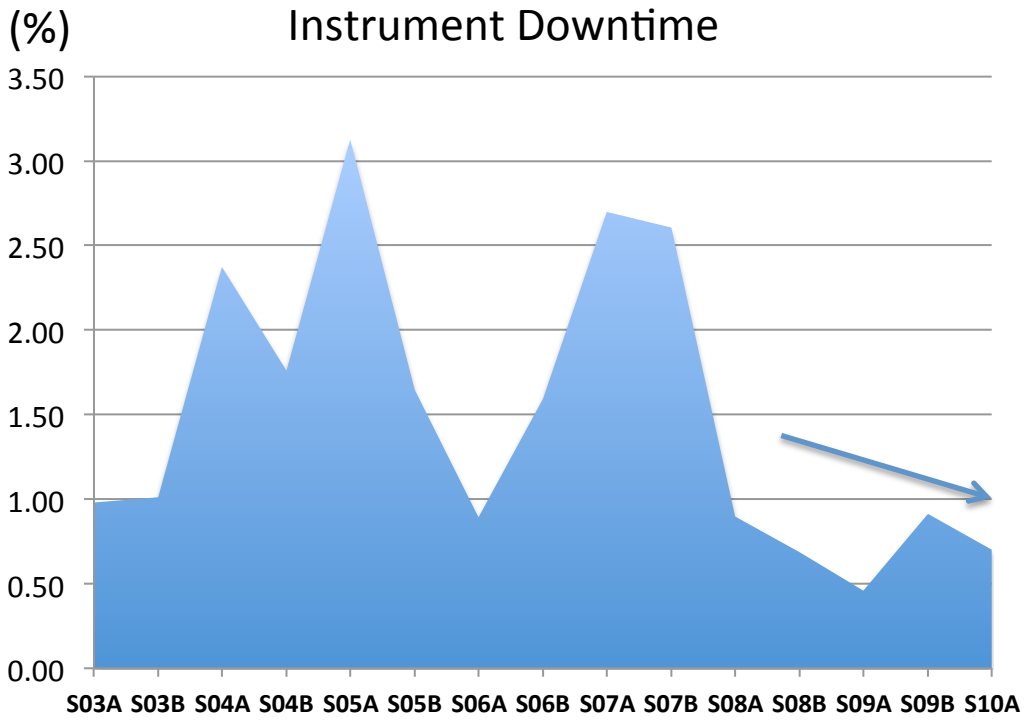




Highlight (Downtime)

To keep functional,





✓ ***Still functioning well***

Executive Summary

To keep operational and competitive,

MOIRCS

- Channel-1 trouble and recovery, and New NBF and ND

Suprime-Cam

- (New CCDs) Better linearity, on-site DA system, and New NBF

AO188+IRCS

- DM failure and recovery, and NGS resumed.
- LGS development (=> Hayano-san's Talk) and Open in S11A.

HDS

- Image-slicer => Tajitsu-san's Poster

FOCAS

- FDCCD upgrade

FMOS

- IRS1(LR) open use and HR, IRS2 development => Tamura-san's talk

MOIRCS (Channel-1 turret-rotation trouble)

- Recognized on Sep. 28, 2010 (before the first S10B obs.).
- Channel-2 side only Operation during the whole S10B.
  - 2 N (Keck[te]), 2 N (Gemini[te]), 1 N (UH), 4 N (Subaru OpenUse[ip])

    [te]: Time Exchange Program, [ip]: Intensive Program
- One month troubleshooting went fairly well.
  - Fixed within Dec., 2010, and will be verified in Jan., 2011.
- Cause – stack of bad screws used in one holder for new grism.

Good guy.

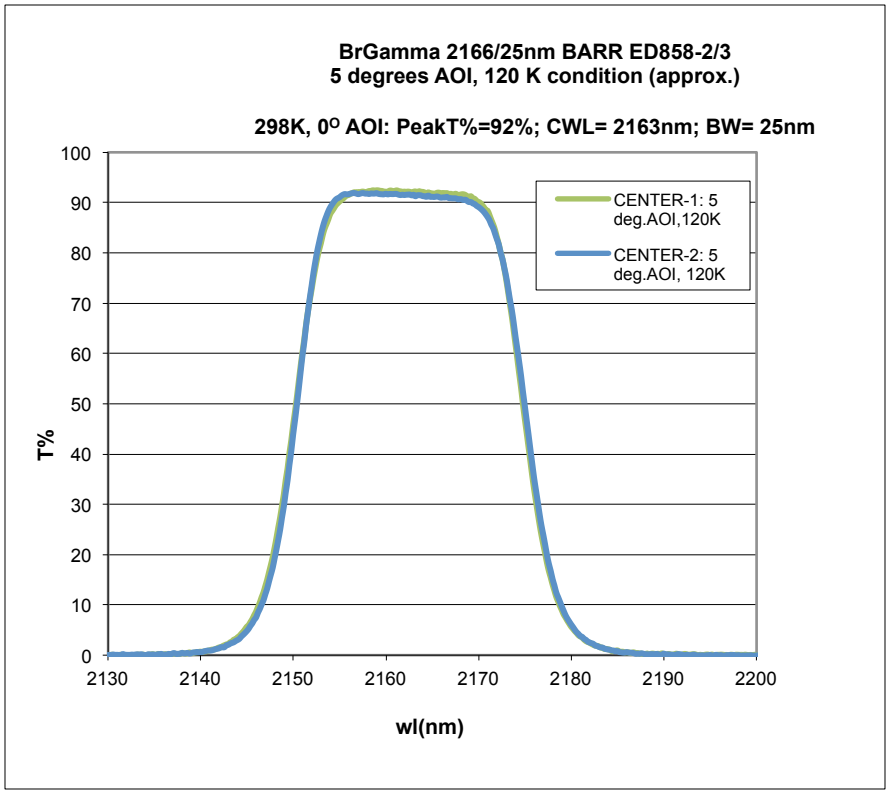
BAD guy (longer by just 1mm…).

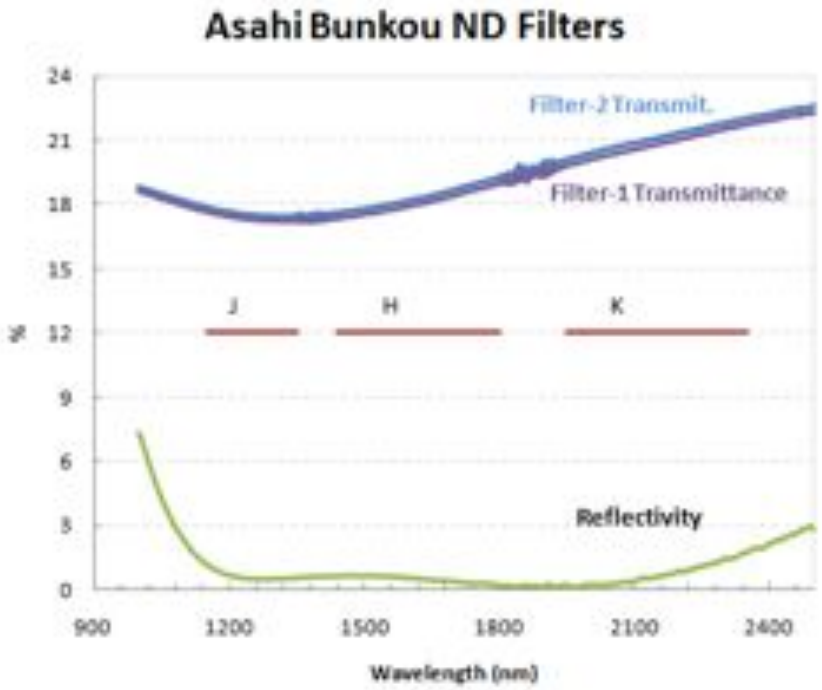
MOIRCS (New Filters)

- **Br γ** (cw/bw = 2.163/0.025 μm) now available.
- **ND filter** become available.

  Main purpose is to provide good-quality Ks-band Dome flats

  (but can be used to scientific data acquisition).



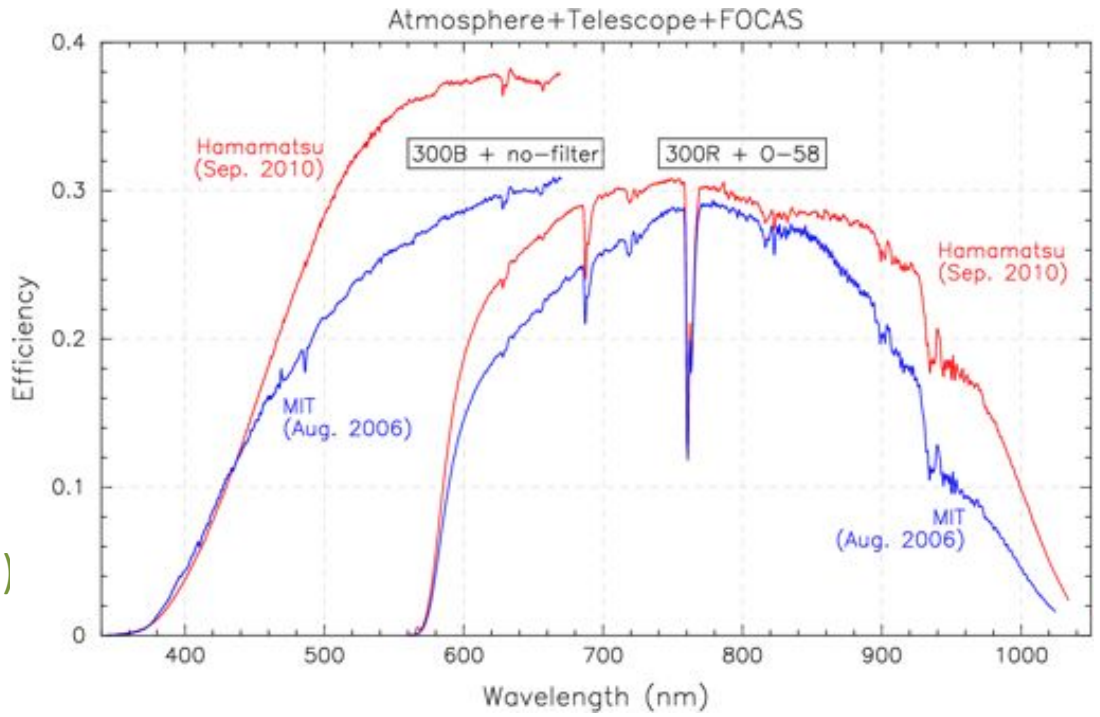


FOCAS (CCD Upgrade)

Engineering Obs: June 2010

Open use : from Oct. 2010

- Improvements on
  - higher efficiency,
  - less fringing,
  - faster readout,
  - better cosmetics
    (only 1 dead column in 2 CCDs)
- However, please note..
  - ✓ extensive cosmicrays
  - ✓ wider CCD gap (50→70pixel)



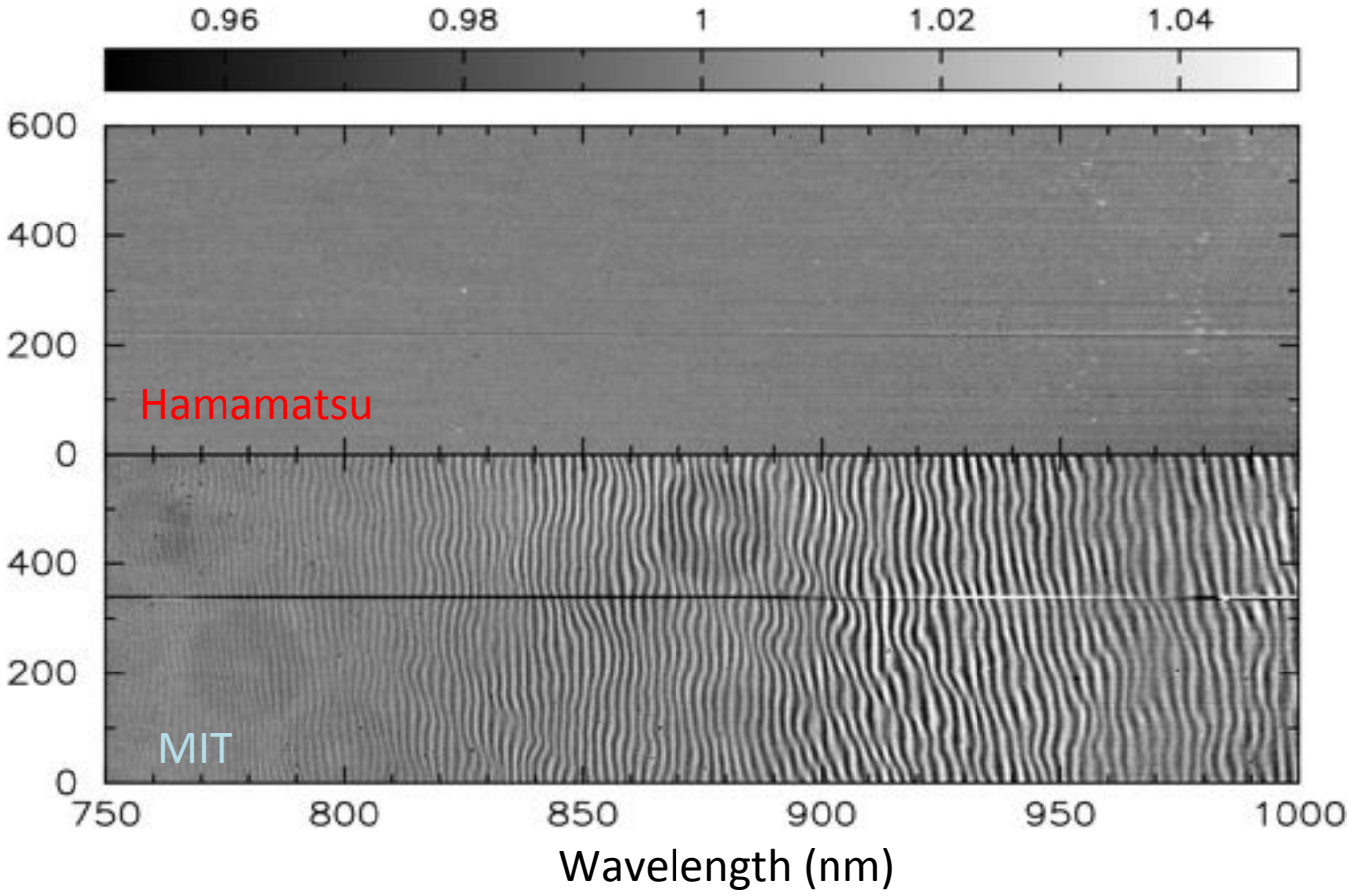
Total Efficiency (compared to the MIT CCD)

~0.9@400nm, ~1.3@500nm, ~2@1000nm

FOCAS (CCD Upgrade)

Less fringing

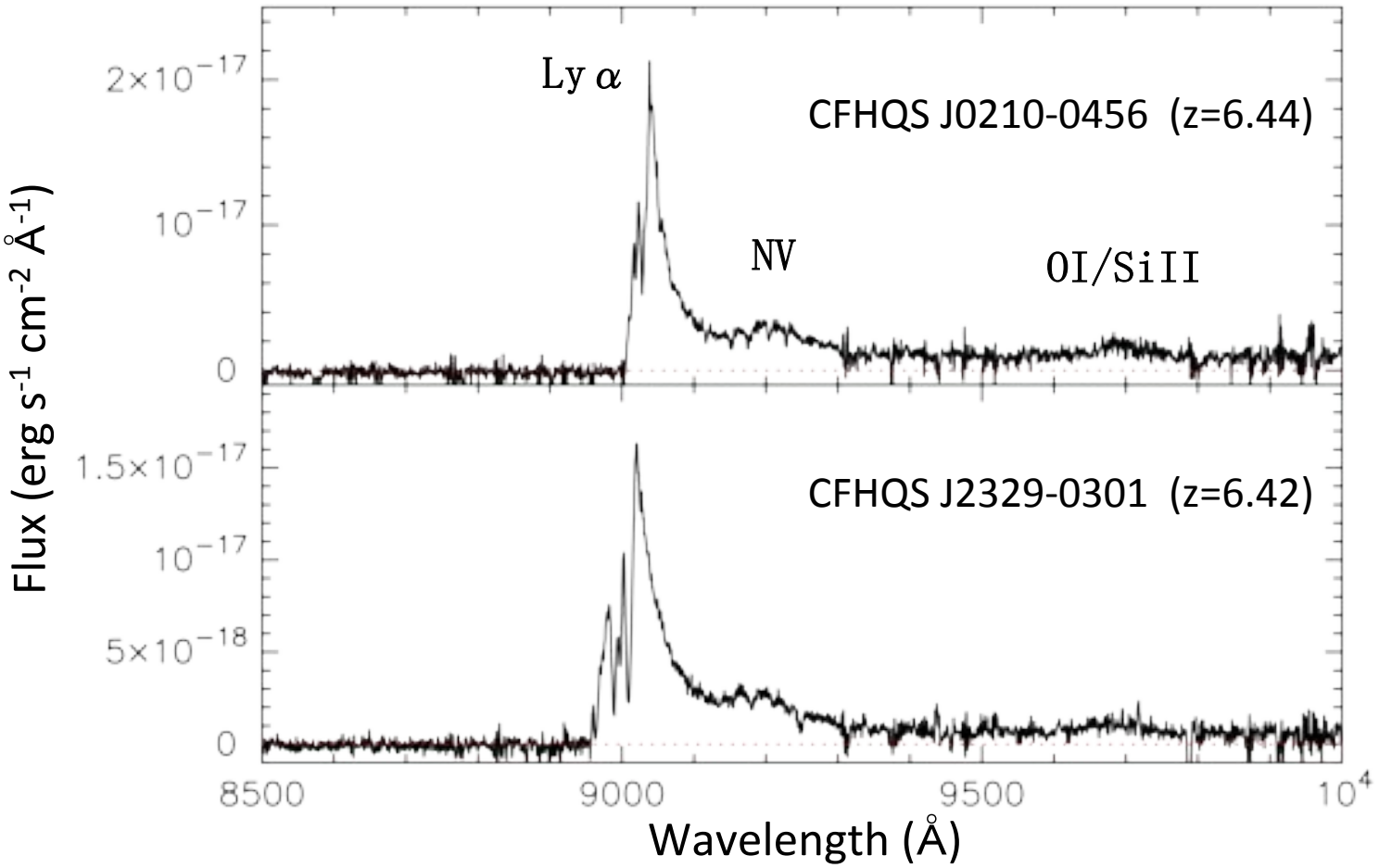
domeflat with 0".8+300R+O58



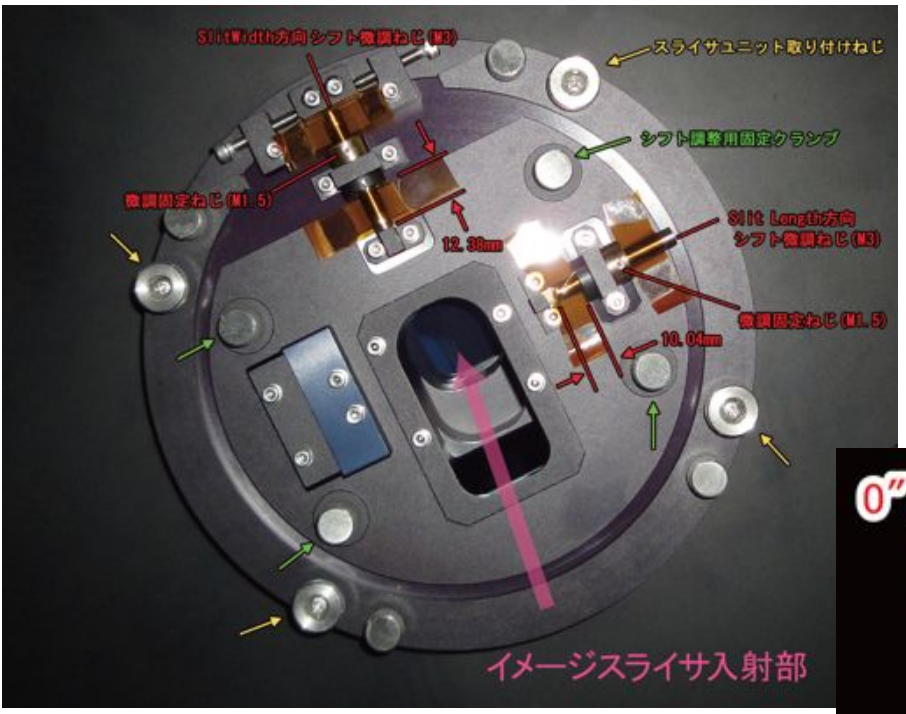
FOCAS (CCD Upgrade)

Performance Demonstration (high-z QSOs)

VPH900 (7500-10500Å, R~2000, ~2hours)



HDS (Image-Slicer upgrade)

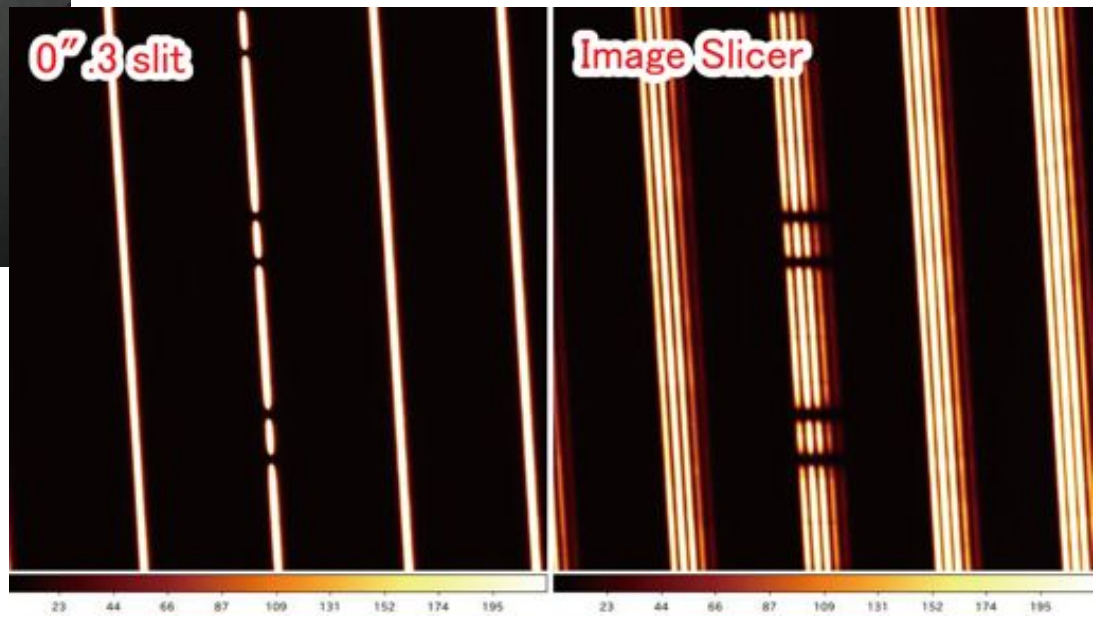


Engineering Obs:

Jun. and Dec., 2010

1.8 times higher efficiency confirmed!

(under 0".68 seeing)

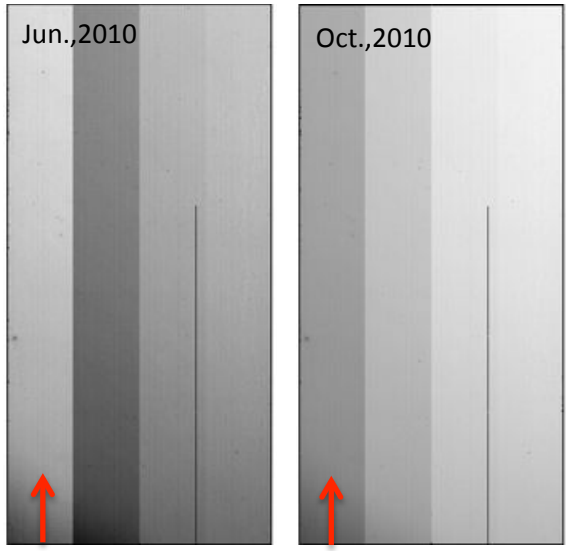


- ✓ Slicing Φ1".5 image into 0".3 x 5 spectra
- ✓ R=110,000 (slit width of 0".3)

=> Please see Tajitsu-san's poster for details.

Suprime-Cam

DET-ID:9
g'-band domeflat

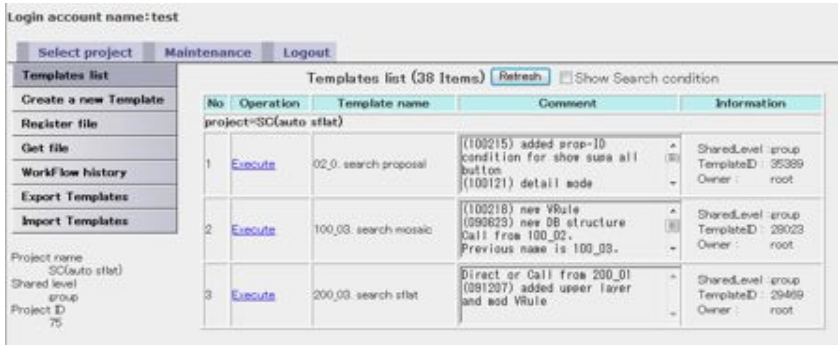


Signal at 1-channel of 1 CCD (DET-ID:9)

- ✓ Found on Sep. 17, 2010
- ✓ After adjusting bias voltage,
  operation has been okay (since Oct., 2010)
- ✓ Please note that gain was changed
  on the channel.

On-site data analysis system available

- ✓ Operation since Mar., 2010
  Data assurance can be done on site
  (Seeing, sky level,… etc.)



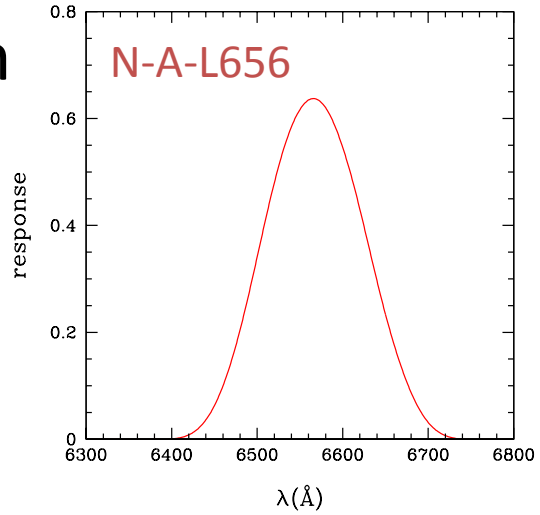
Screenshot of On-site data analysis

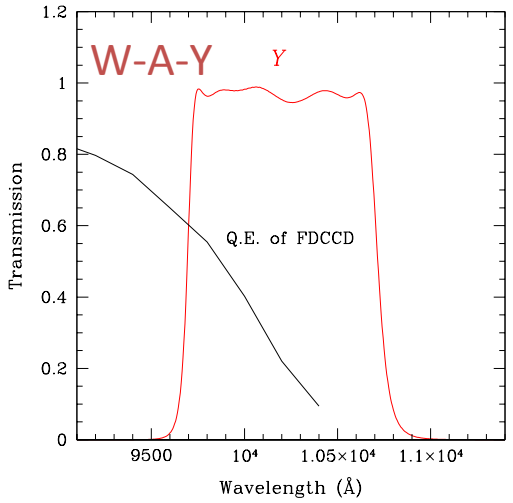
Analysis pipeline (SDFRED2) released

For the data obtained after 2008/07.
(http://www.naoj.org/Observing/Instruments/SCam/sdfred/)

Suprime-Cam (New Filters and Grisms)

- Narrow band filter Open
  - N-A-L656 (Hα): S10B~
  - W-A-Y (Y-band): S11A~
- Grisms will be Open
  - Planning in 2011



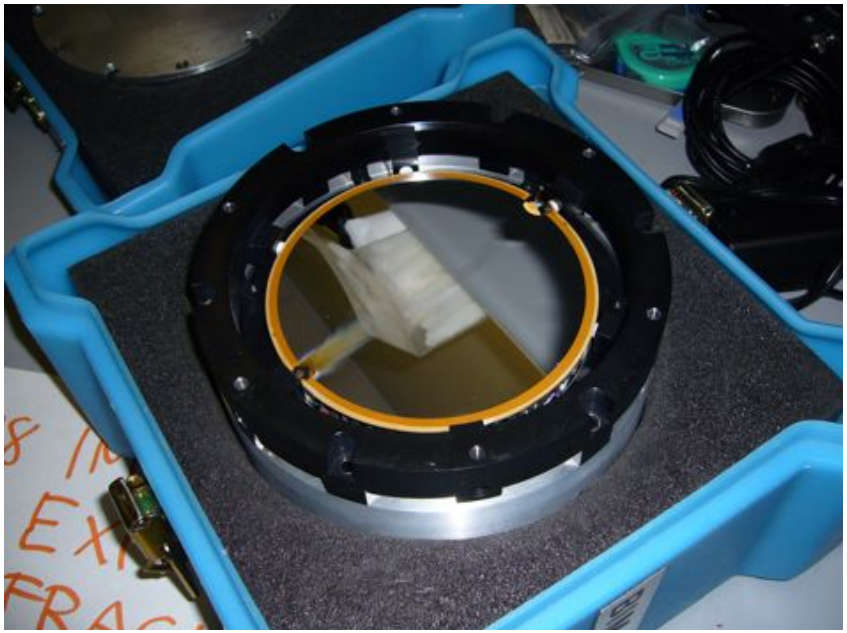


AO188+IRCS (NGS mode)

Failure and Recovery of DM

Occurred on Jan. 27, 2010

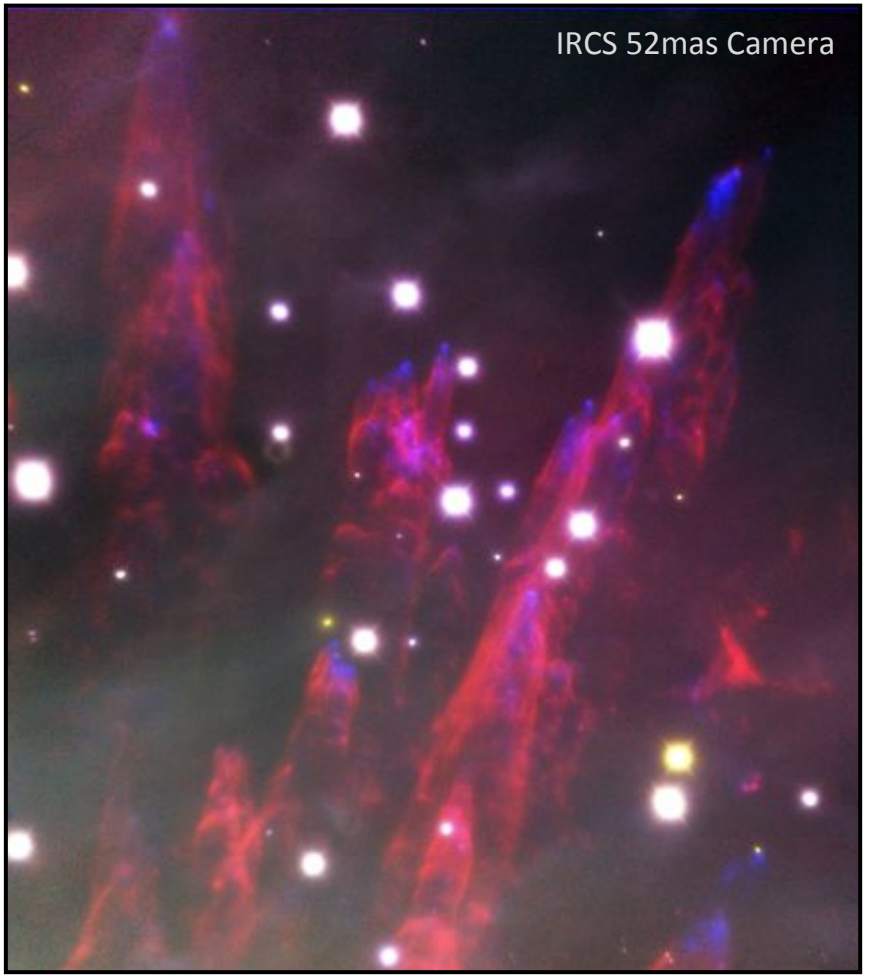
(during LGS Engineering run)



13N Backup Programs selected by TAC

4N → IRCS (w/o AO188) Obs.

Recovered in late Oct., 2011

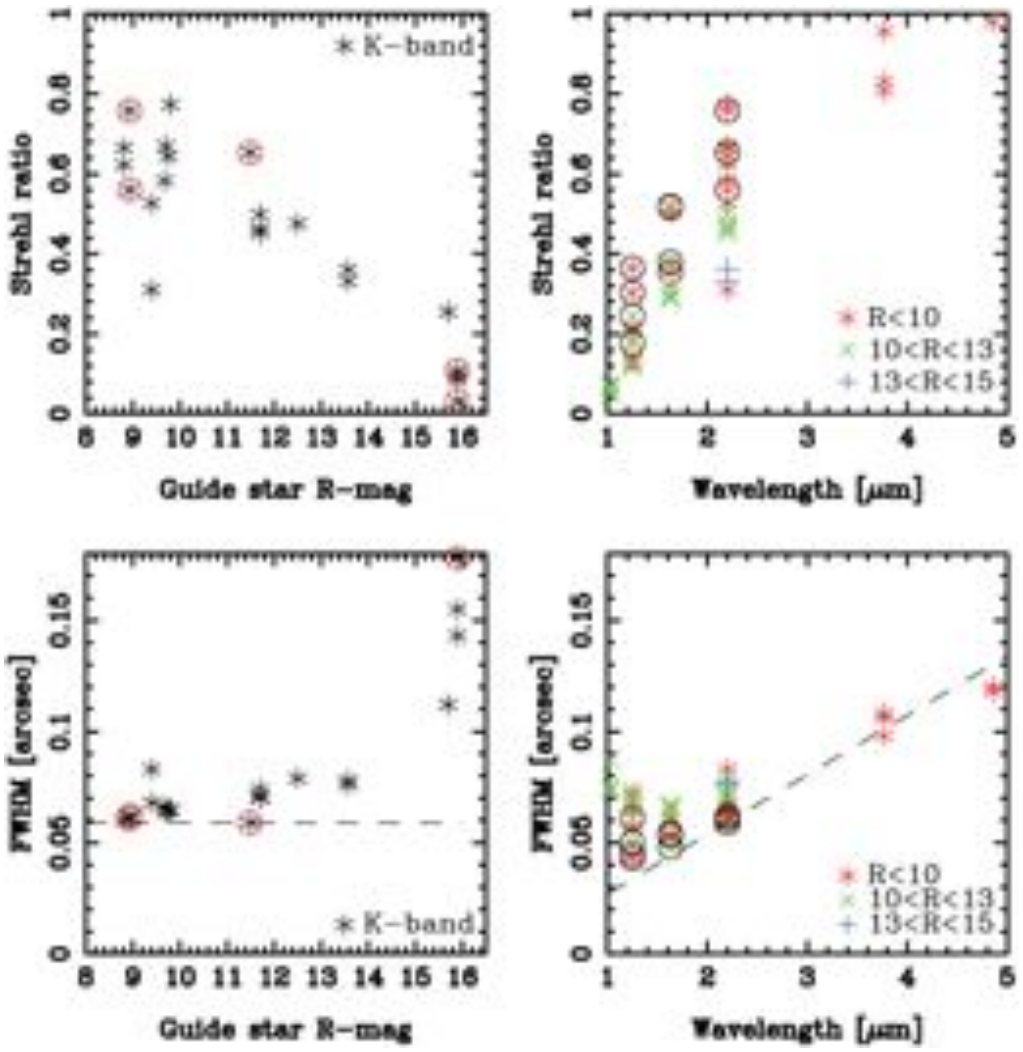


Red: H2(1-0) 2.122μm, Green: Brγ 2.167μm, Blue: [FeII] 1.644μm

50”x 63”

AO188+IRCS (NGS mode)

Performance w/ New DM

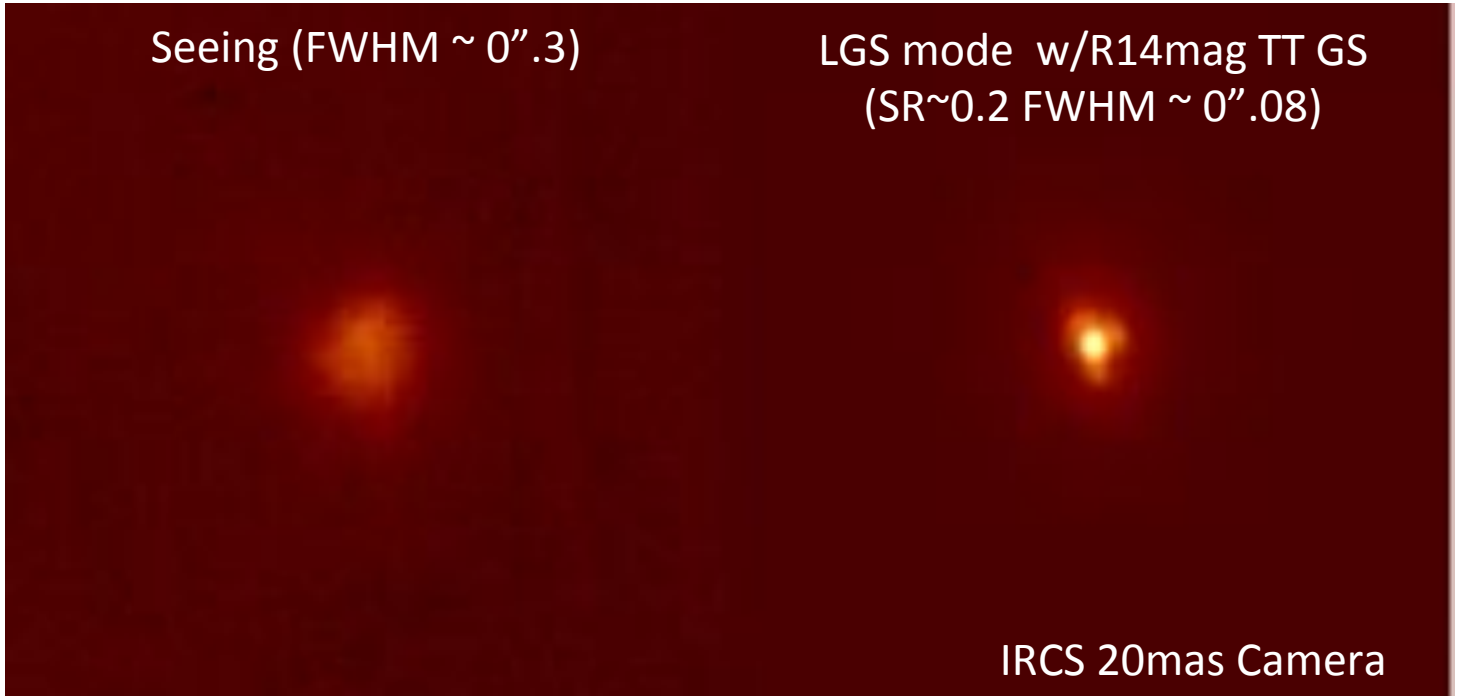


- *Confirmed that AO188 performance with new DM is almost same as before its failure.*
- Resumed OpenUse since Nov., 2010.

Points w/o circle: before DM failure
Points w/ circle: after DM replacement

AO188+IRCS (LGS mode)

Successful Closed Loop using Laser Guide Star



- ✓ *Obtained diffraction-limited PSF w/ LGS*
- ✓ Will start OpenUse from May 2011.

Testing is underway..

=> Please tune in Hayano-san's talk

Operations of Existing Instruments

- First generation instrument: (>10yrs old)
  - ✧ Some parts: ~15 yrs old…
- Still succeeding in keeping in good shape
  - ✧ Thanks to dedicated works by support staff
  - ➢ *Once serious trouble occurs, huge resources are required.*
- ➢ Serious investigation required for the *"future" of "Existing instruments"* upon 'Users'' demands.

Especially in consideration of the future instrumentation in Subaru.

We appreciate your kind cooperation about

Pre-imaging (30min; FOCAS and 1hour; MOIRCS), and

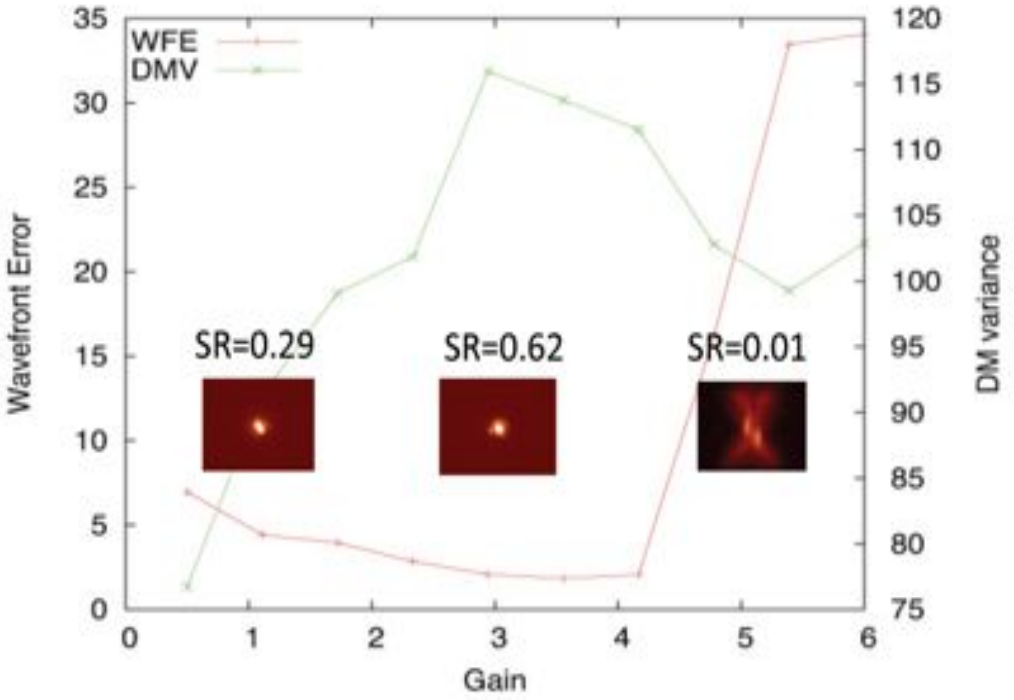
Clear information on MOIRCS MOS masks and S-Cam filters

We look forward to your continued support for these.

AO188+IRCS (NGS mode)

(Complex) Operation Progress

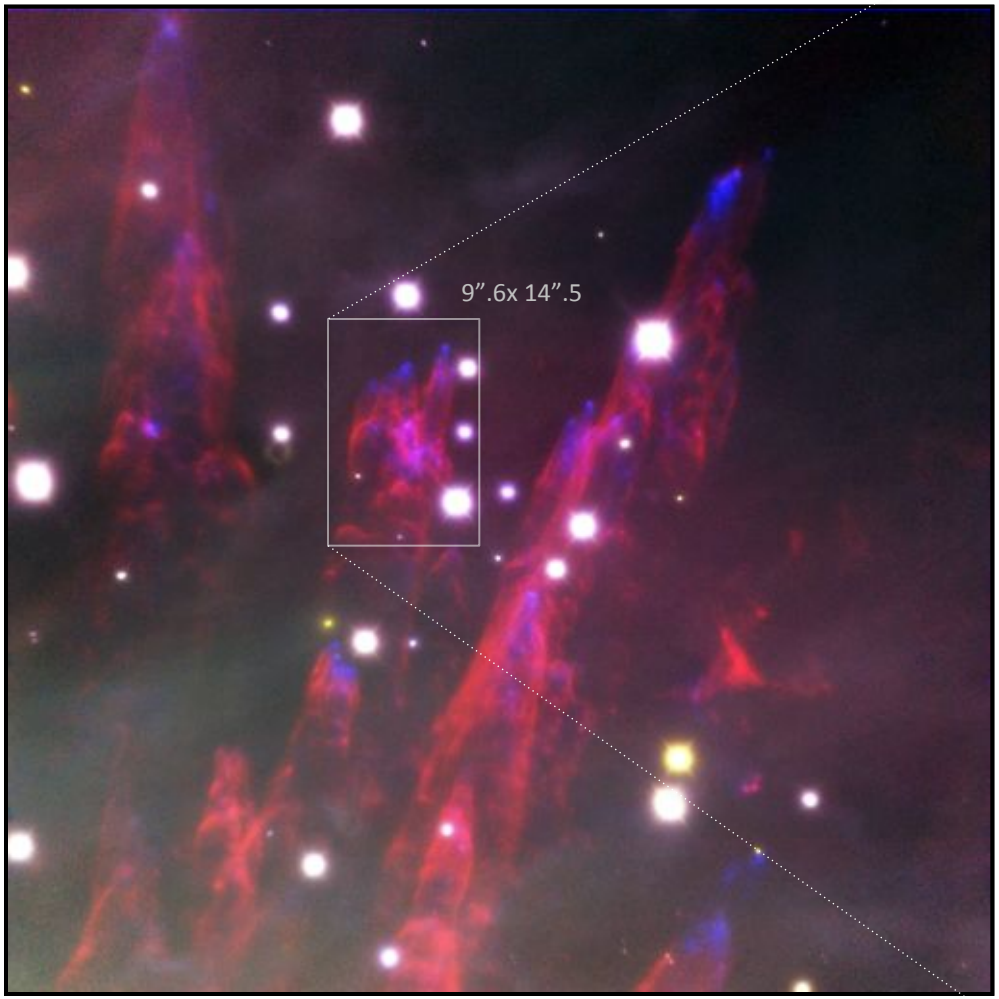
- ✓ Most of NGS commands can be executed from OCS side
- ✓ Efficient parameter tuning realized
- ✓ ADI, Non-sidereal, Parallactic angle spec. ready.



NGS parameter tuning (gain scanning)

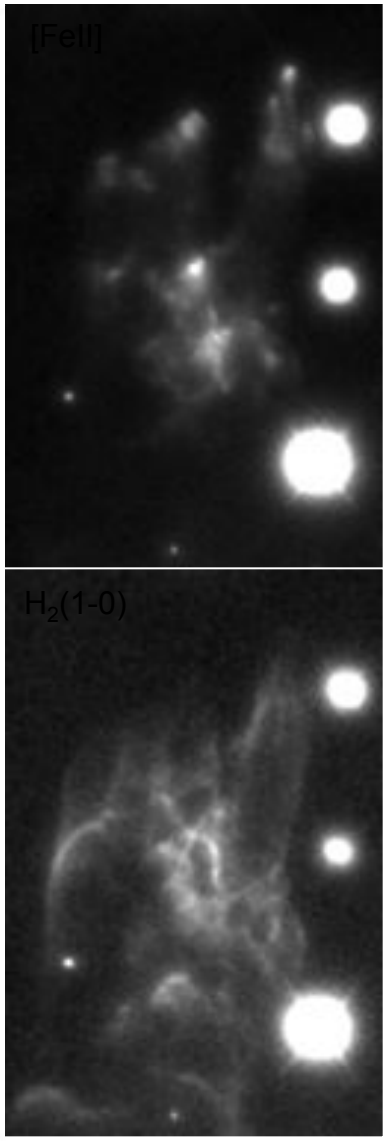
=> LGS operation could be even more complicated…

AO188+IRCS (DM resume)



IRCS 52mas Camera
Red: H2(1-0) 2.122μm, Green: Brγ 2.167μm, Blue: [FeII] 1.644μm

63”x 63”



Gemini
LGS Altair+NIRI