



Status of Existing Instruments

Subaru Users' Meeting 2009

Hiroshi TERADA
(Science Operation Division)



Status Summary

To keep functional,

No major trouble in 2009

Aging, but Stable

w/ Huge efforts from

Support Staff

(Support Astronomers

and Instrument Group)

Support Astronomers

Yosuke Minowa (AO188)

Takuya Fujiyoshi (COMICS)

Takashi Hattori (FOCAS)

Akito Tajitsu (HDS)

Tae-Soo Pyo (IRCS)

Ichi Tanaka (MOIRCS)

Fumiaki Nakata (Suprime-Cam)

Kentaro Aoki (night support)

Miki Ishii (night support)

Instrument Group

Stephen Colley

William Gorman

Lucio Ramos

Lee Xion

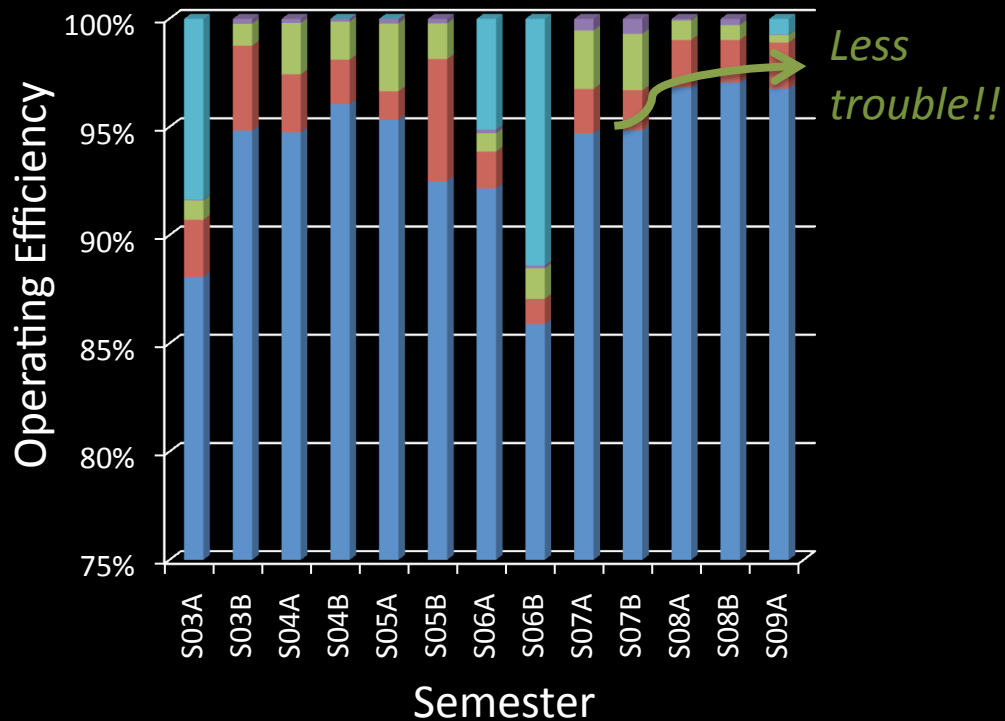
Yoshiyuki Doi

Brian Elms

Koji Omata

Naoyuki Tamura (FMOS)

■ Instrument trouble time



Less trouble!!



Status Summary

To keep competitive,

MOIRCS

- New NBFs, and “fringe-free” BBFs

Suprime-Cam

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

AO188+IRCS

- NGS improvement, operational features, and high dispersion upgrade
- LGS mode open (~S10B) -> Hayano-san's talk

HDS

- Linearity correction, and Image-slicer upgrade

FOCAS

- CCD upgrade

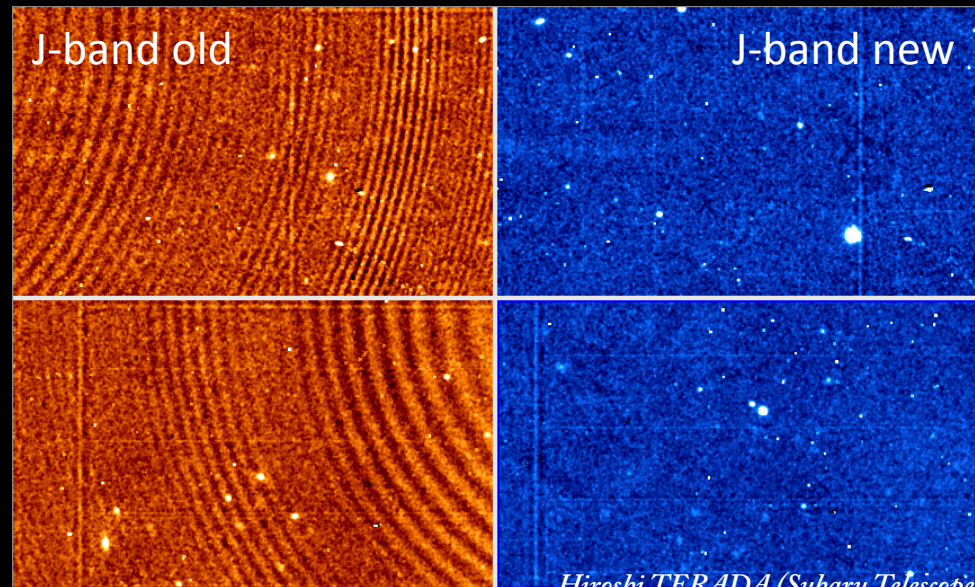
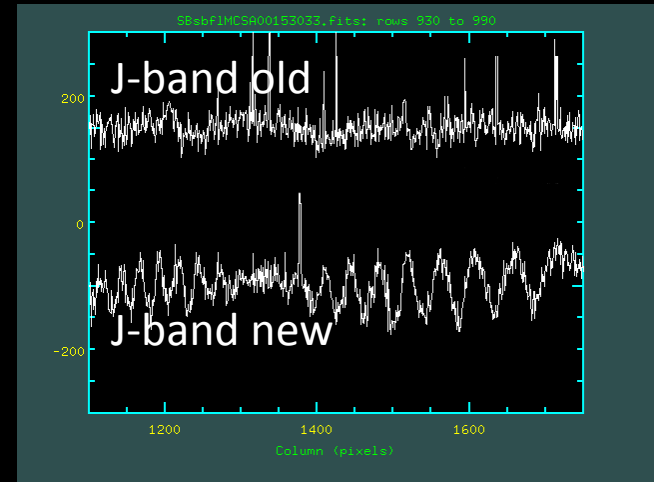
FMOS

- IRS1 open (S10A; May, 2010) -> Takato-san's talk



MOIRCS

- S10A-- 3 new narrow-band filters
CO (2.288 μ m/0.023 μ m)
NB2095 (2.095 μ m/0.025 μ m)
NB1550 (1.550 μ m/0.018 μ m)
* Please refer to filter policy for use
- J-, and H-band filters
“fringe-free”
*all the broadband filters
(YJHKs) w/o fringing*



Hiroshi TERADA (Subaru Telescope)



Suprime-Cam (in 2009)

1. New CCDs (linearity)

- ✓ Voltage setting changed on Dec., 2008

=> Linearity improved a lot!

-2008/12/3: 2-5% non-linear @ 500ADU

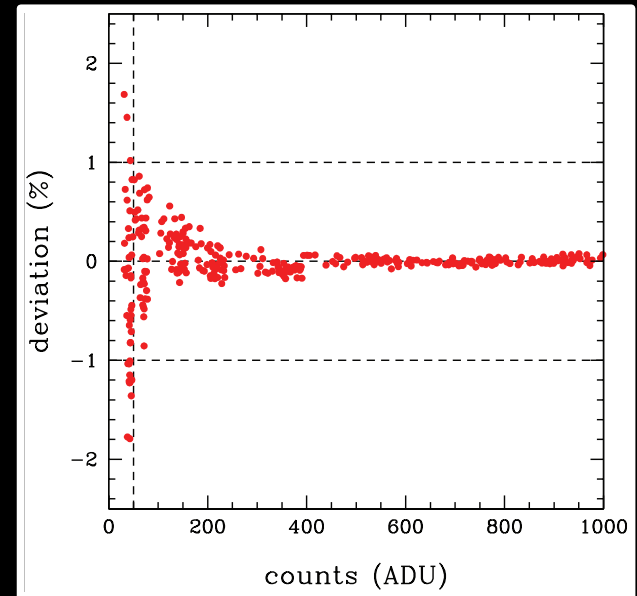
2008/12/24-: <1% non-linear @ >50ADU

<2% non-linear @ <50ADU

2. On-site data analysis system

- ✓ Start test operation since Oct, 2009.

Seeing, sky level,... can be measured right after the snap.

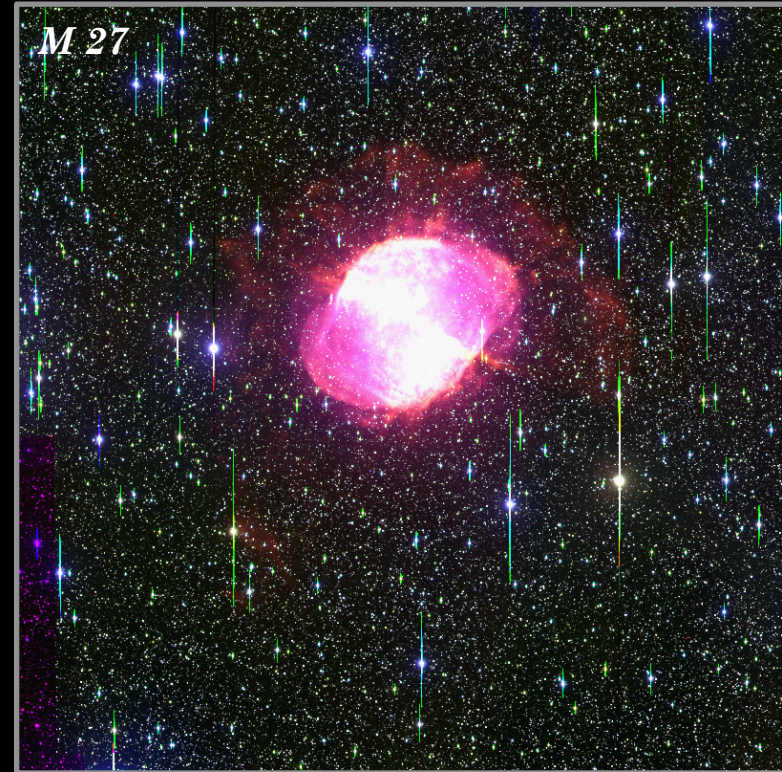
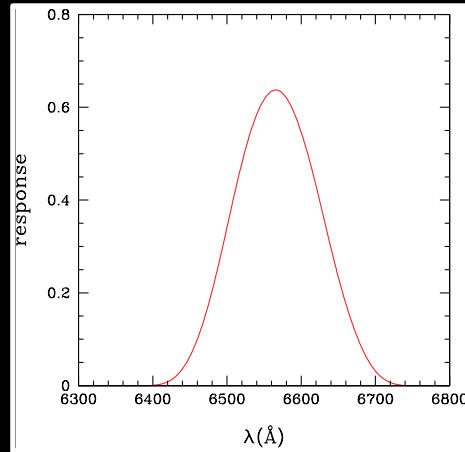




Suprime-Cam (in 2010)

1. New narrow band filter (N-A-L656; Halpha)

- ✓ Done testing
(Aug., 2009)
- ✓ Will be open
from S10B.



Red: Halpha, Green: R, Blue: B

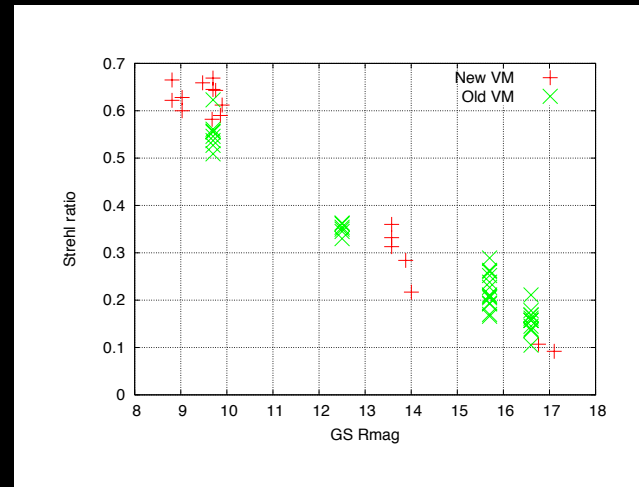
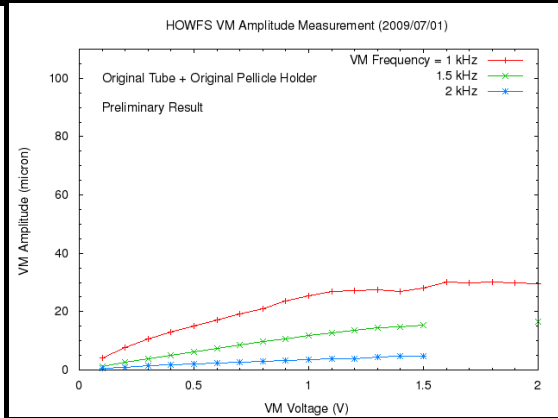
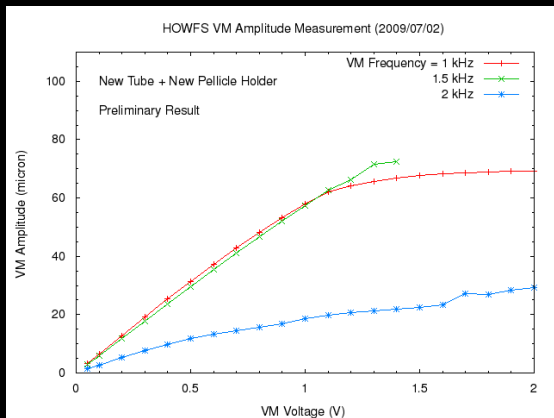
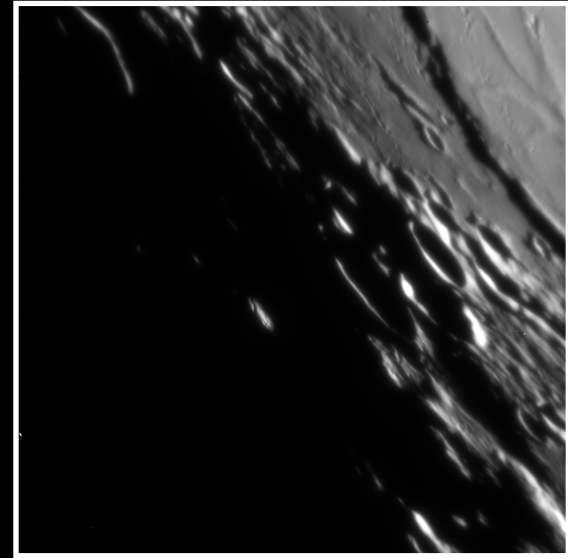
2. On-site data analysis system

- ✓ Full operation possibly in S10A.
- ✓ Progressing toward HSC system...



AO188 (in 2009)

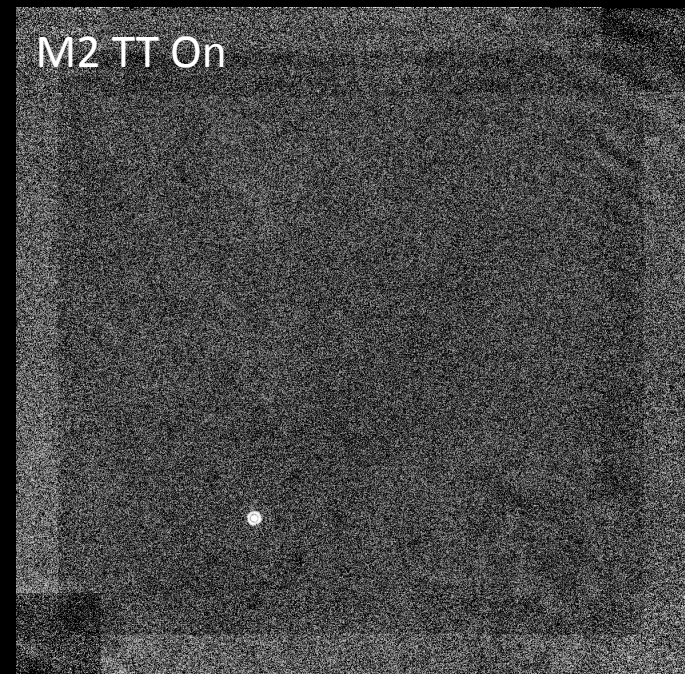
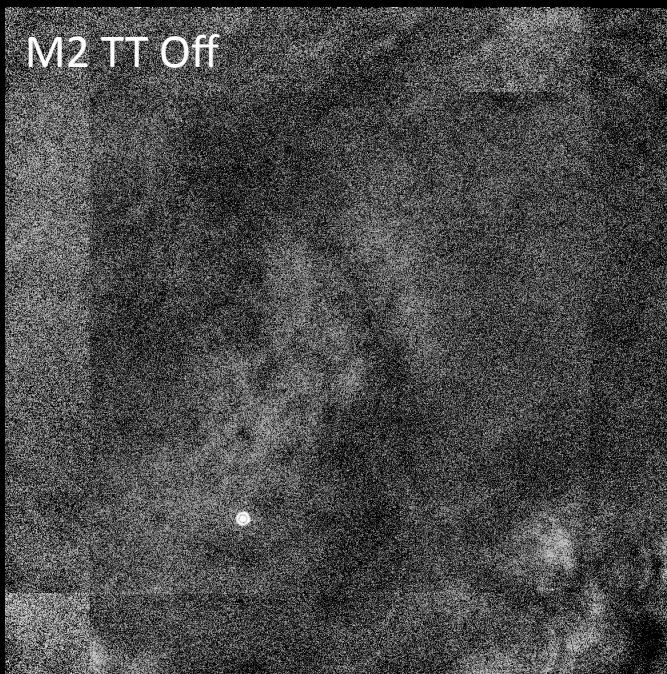
- Since opening in Oct. 2008, NGS mode has been working very well.
- Vibrating Mirror modification
 - ✓ Performance improved for bright star
 - ✓ Better optimization for tuning parameters





AO188+IRCS (in 2009)

- Smooth and usual operation
(incl. slit-scan, ADI, parallactic angle spectroscopy)
- NH3 Gas cell has been installed and quickly tested (Dec., 2009).
- Tip-Tilt correction w/ IRM2

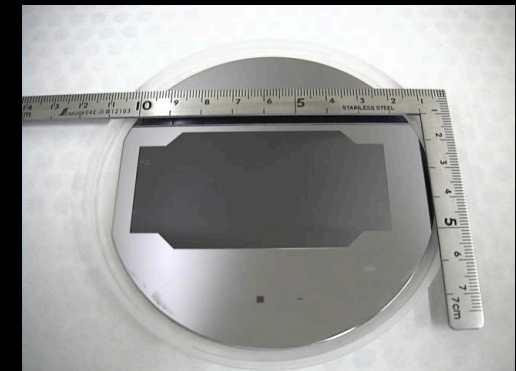
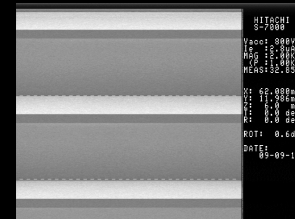
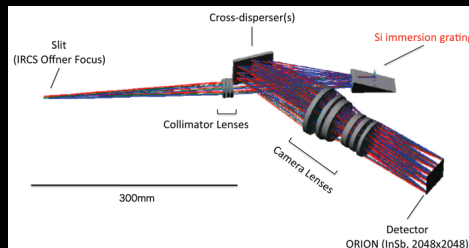


M'-band



AO188+IRCS (in 2010)

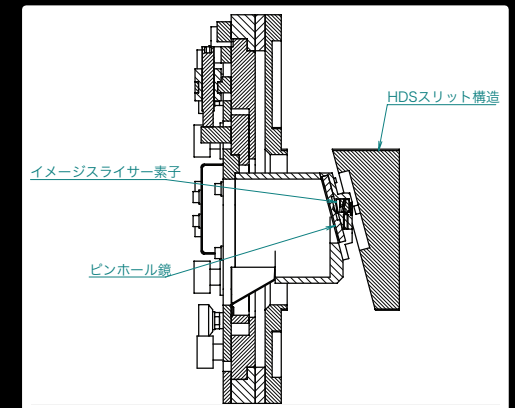
- Laser guide star is expected to be open hopefully from S10B.
 - * after several testings in night time, it will be decided (when and how).
- IRCS High resolution upgrade (w/ Si immersion grating) continues.





HDS

- Linearity issue
 - ✓ Correction script available from the web site:
<http://www.naoj.org/Observing/Instruments/HDS/>
 - ✓ Details will be published in PNAOJ.
- Image-slicer: $0''.3 \times 5$ slices for $\phi 1''.5$
(Kajino et al., Kakenhi)
 - ✓ Under development / fabrication.
 - ✓ Could be tested in 2010.

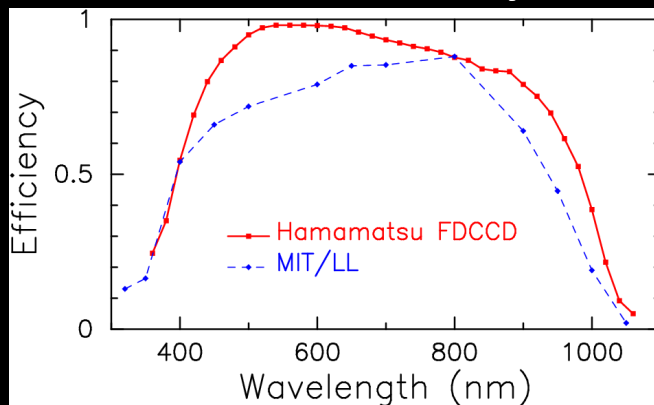




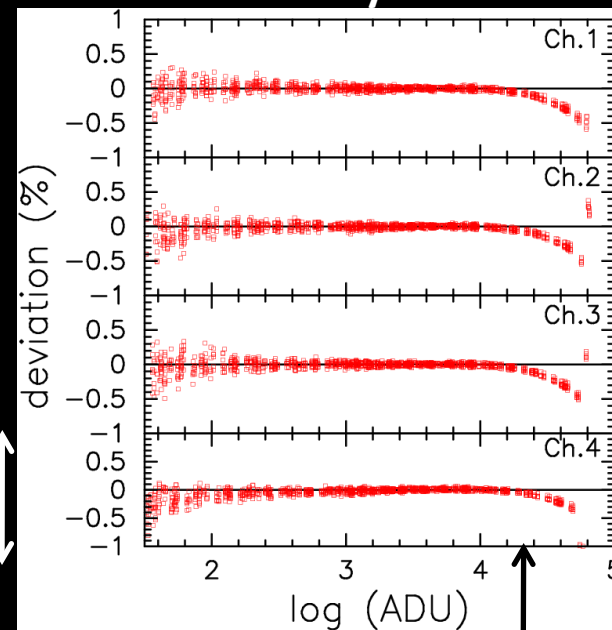
FOCAS: CCD upgrade (Mar.-Dec., 2009 @ ATC ①)

- Performance Evaluation for CCD (itself)

Quantum Efficiency



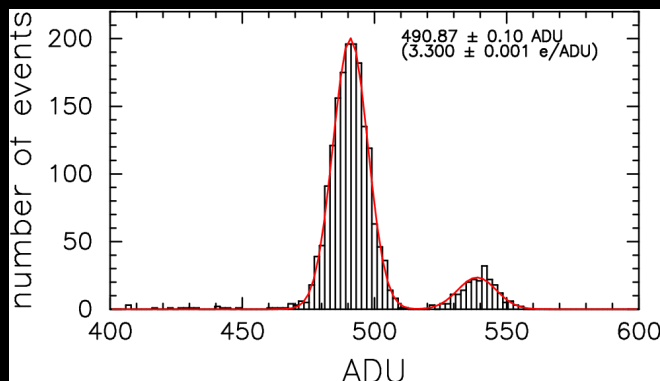
Linearity



±1%
↑
↓

30000ADU
(~10⁵e)

Gain / Charge Transfer Efficiency

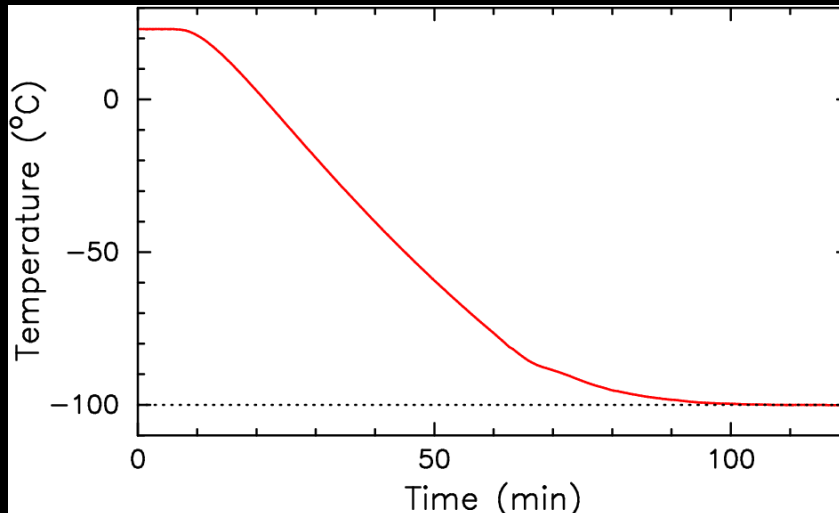
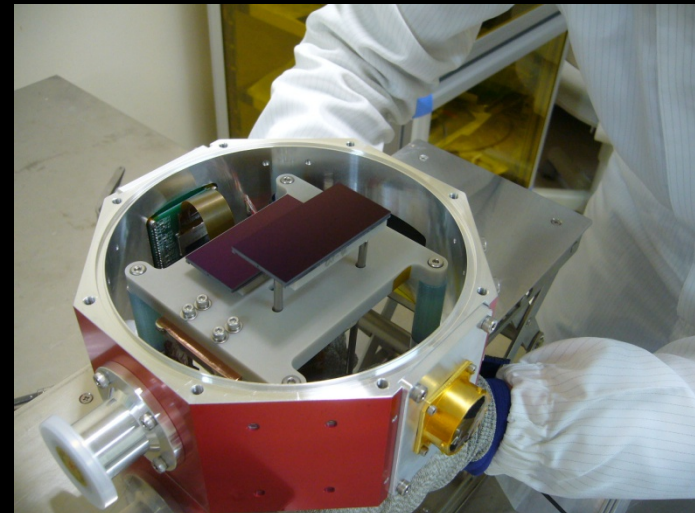
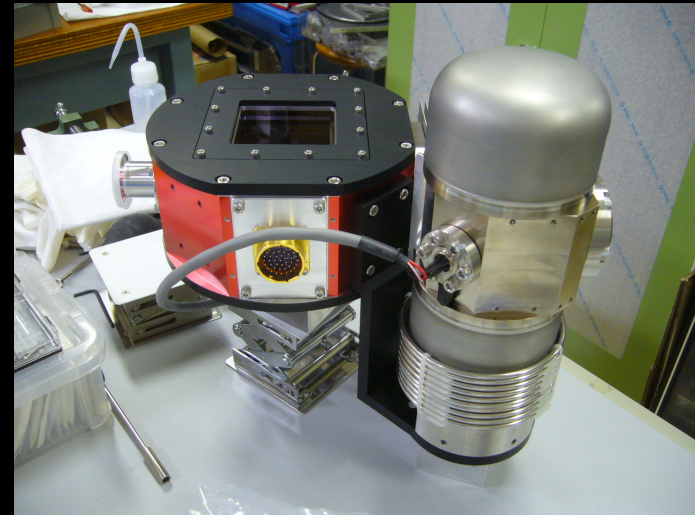


- +
• Dark Current
• cosmetics.....



FOCAS: CCD upgrade (Mar.-Dec., 2009 @ ATC ②)

- Dewar Assembly
- Shape Measurement
- Vacuum Testing
- Cooling Testing
- Readout Electronics (MFront2)
Assembly / Testing
- CCD Install





FOCAS: CCD upgrade (in 2010)

- Jan. Ship to Hawaii
- Feb.-May Detailed investigation to *optimize readout parameters.*
- Feb.-May Combined with FOCAS software system
- Jun. Installed into FOCAS
Function / Performance testing
- Jun. Attached onto the telescope
Extensive daytime / night time testing



Operations: Pre-imaging / Mask / Filter

- We greatly appreciate your cooperation about Pre-imaging (30min for FOCAS and 1hour for MOIRCS).
We look forward to your continued support with this.
- Please explicitly describe the minimum & required set of MOIRCS MOS masks and S-Cam filters in your proposal (Entry 11: Instrument Requirements).