Instrument Status

Takashi Hattori (Instrument Engineering Division, Subaru Telescope)

Subaru UM2025

PFS

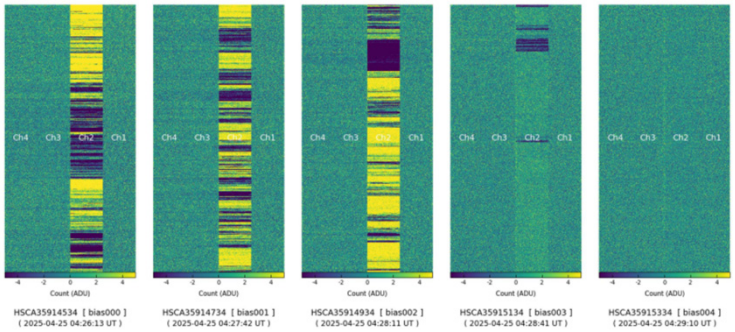
- PFS session (10/30 16:30-17:45)
  - Instrument status report by Koshida-san
  - poster presentations
    - P09 Instrument Performance verified through the PFS engineering observations (Moritani)
    - P11 Current status of DRP development for PFS (Yabe)
    - P16 Progress and Challenges in Planning for Subaru PFS Open-Use Programs (He)

HSC

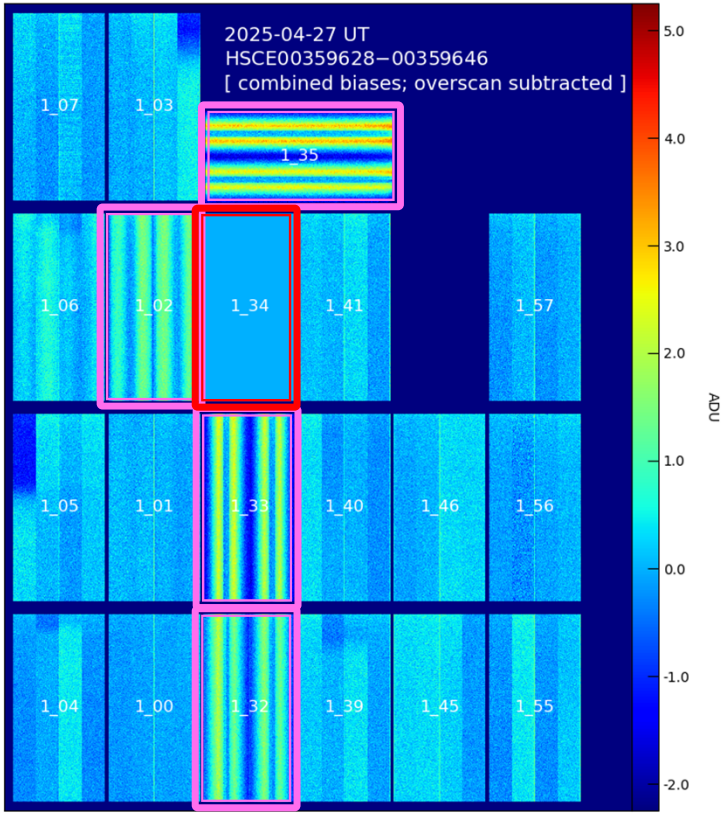
- HSC in 2025
  - CCD 1_34 readout problem
  - New filter MBQ1 opened from S26A
  - FEU issues
    - slow motion while closing the OPT/IR stacker (April, 2025)
      - this issue happened only during the 2nd half of April run
    - HSC-r2 lock-pin insert problem (July-Aug., 2025)
      - resolved by adjusting the bracket for the positioning sensor

HSC

- HSC in 2025
  - CCD 1_34 readout problem
    - started with occasional noisy pattern
    - then, readout failure with all pixel value=0
      - stripe pattern in neighbor CCDs which use the same readout board
    - disabled CCD 1_34 on 7/17 UT



overscan subtracted bias frames (4/25/2025 UT)

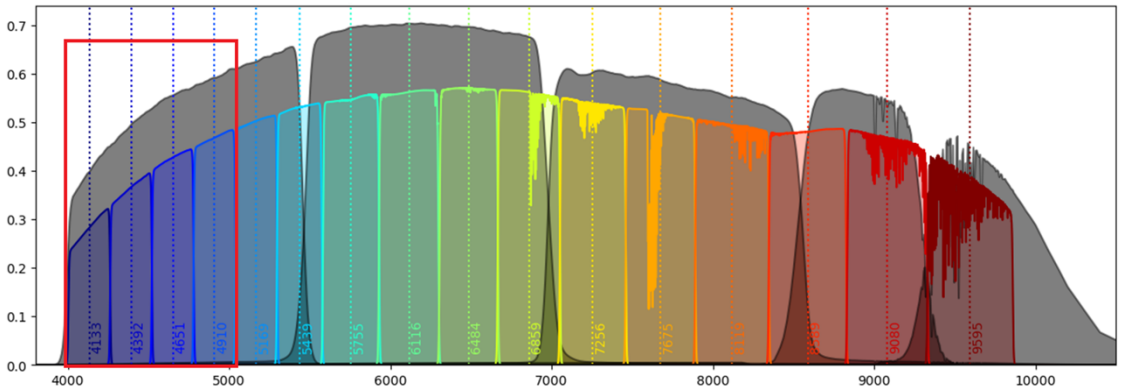


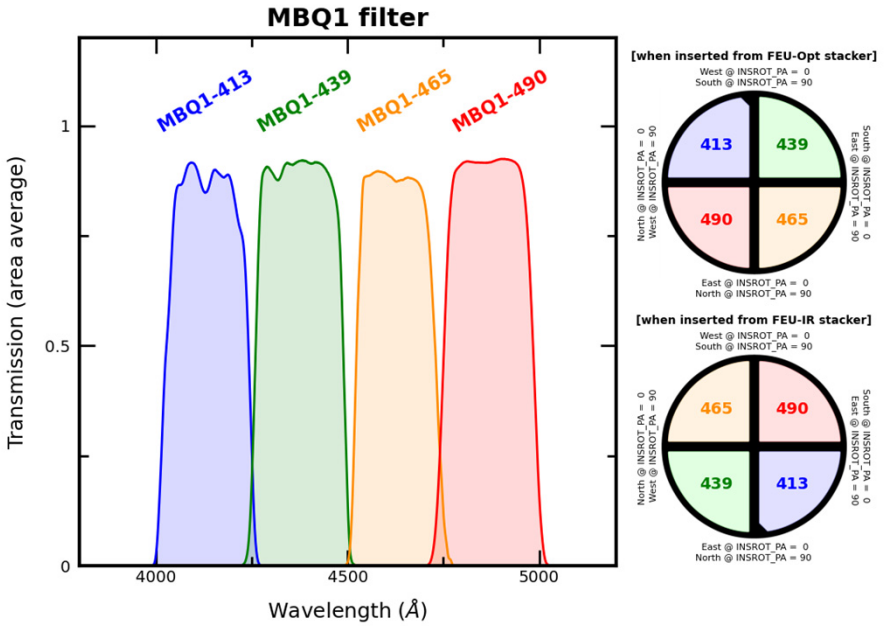
overscan subtracted bias of 1_34 and neighbouring CCDs (4/27/2025 UT)

https://subarutelescope.org/Instruments/HSC/hsc_announcement_2025apr.pdf

HSC

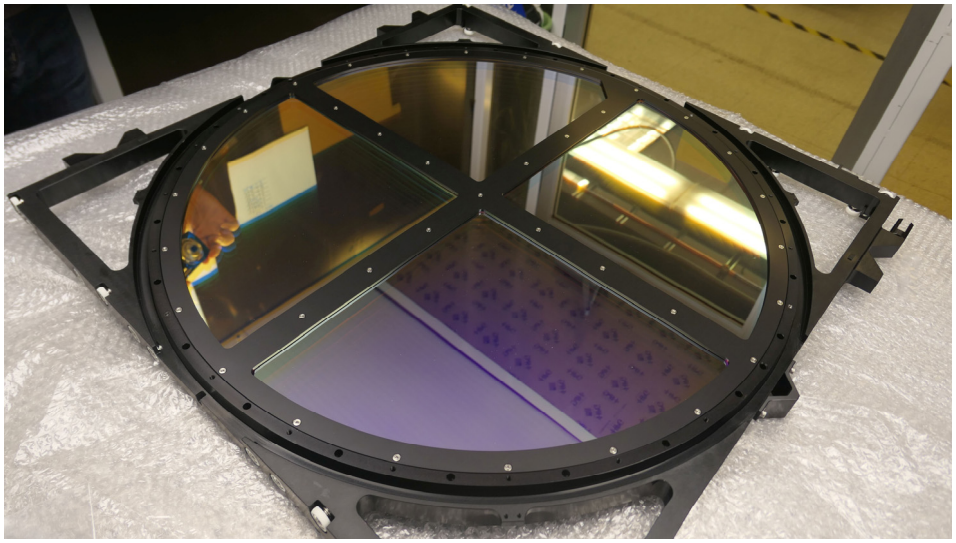
- HSC in 2025
  - New filter MBQ1 opened from S26A
    - the first filter of medium-band filter sets
      - MB413, 439, 465, 490
      - one MB filter in each quadrant
    - received in mid-June



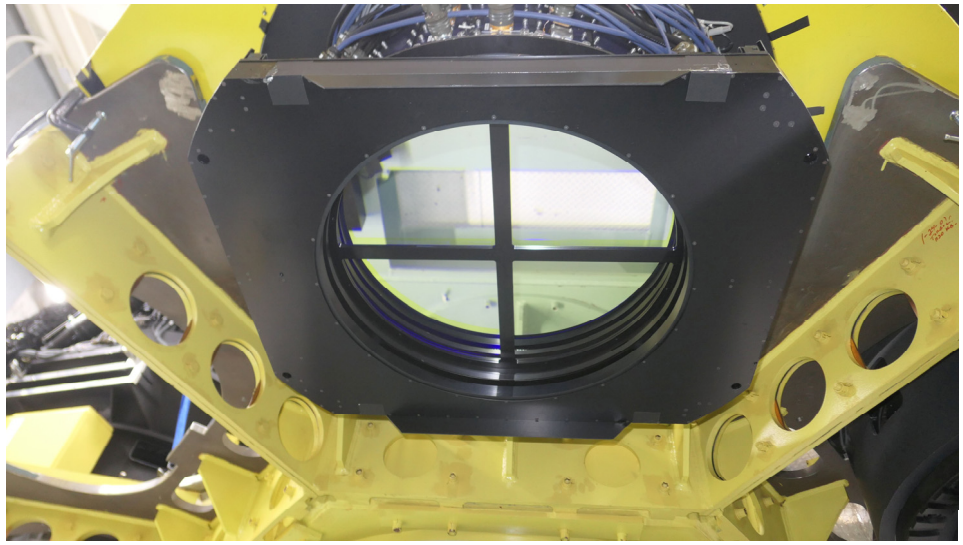


HSC

- HSC in 2025
  - New filter MBQ1 opened from S26A
    - operation test successfully done in July
    - announced the opening in S26A call for proposal



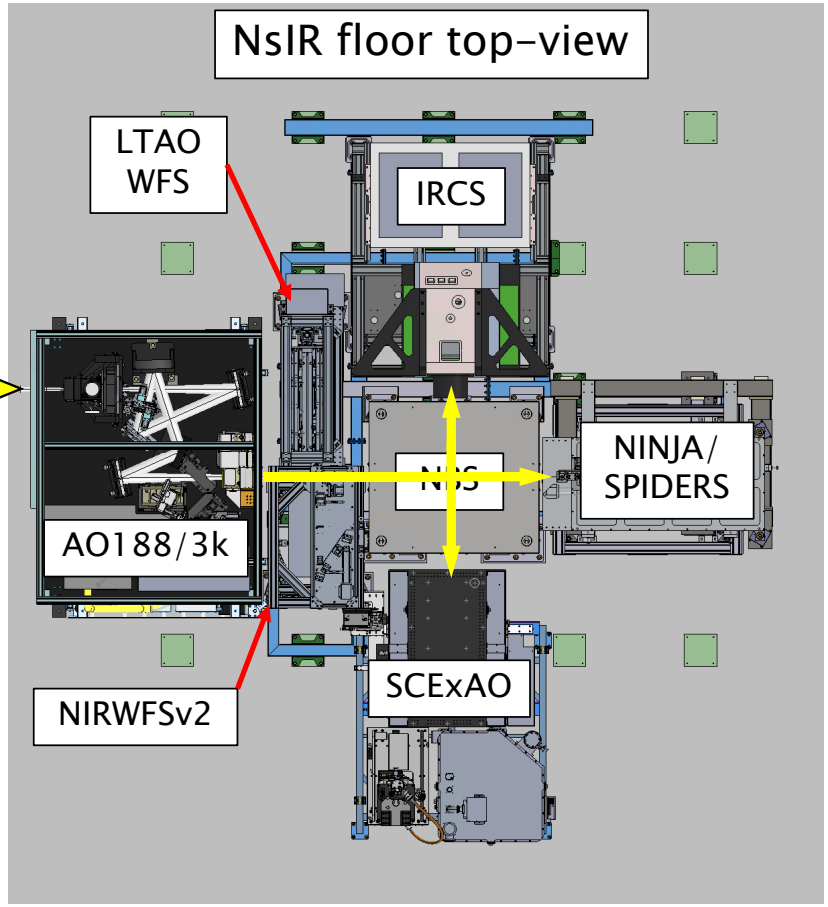
assembly with the filter frame

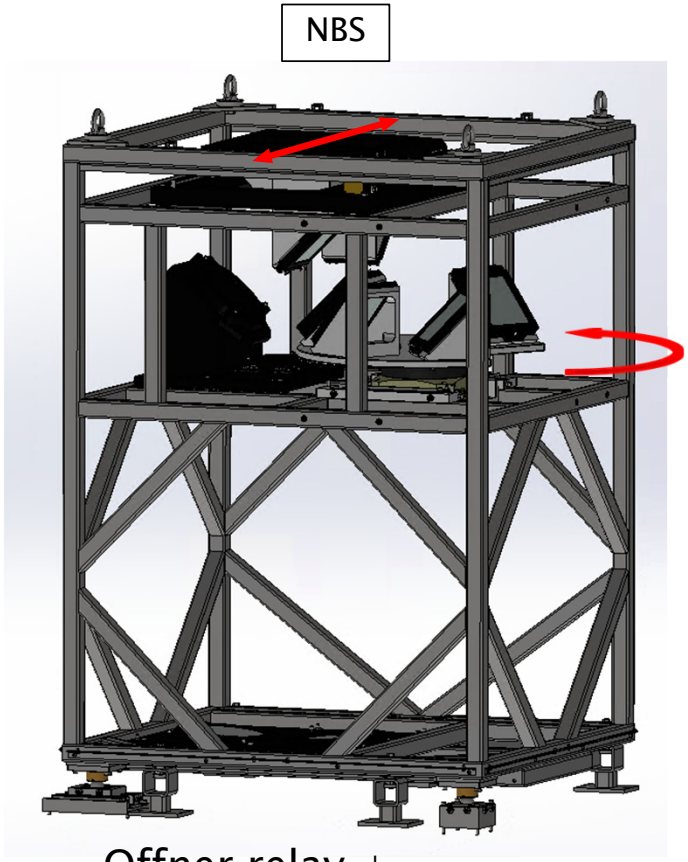


operation test in HSC Camera Unit

NsIR upgrade (with Nasmyth Beam Switcher)

- outline



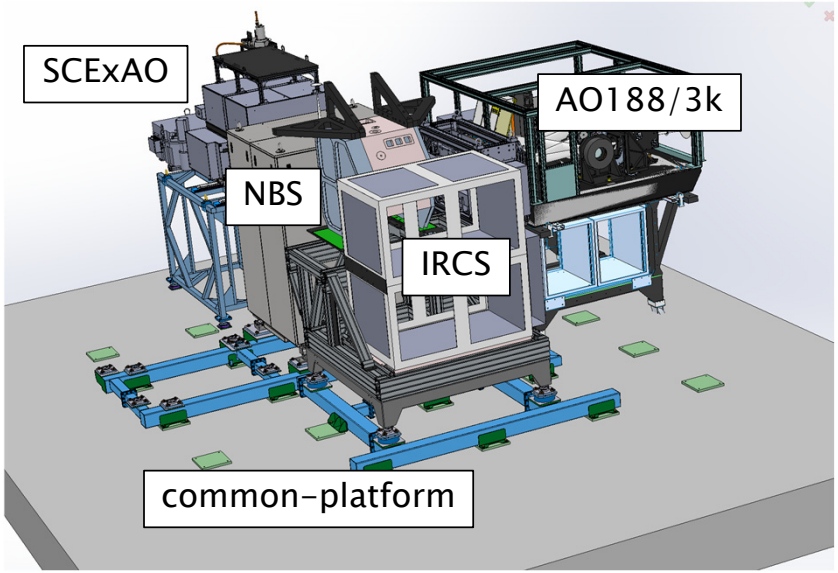


Offner relay +
switching mechanisms

NsIR upgrade (with Nasmyth Beam Switcher)

- installation in 2025
  - May-June : NBS assembly at Hilo base, FARO measurement of common-platform
  - July : common-platform
  - August : LTAO-WFS and NIRWFSv2
  - September : Nasmyth Beam Switcher (NBS), IRCS, SCExAO
  - October : engineering observation with NBS+IRCS/SCExAO

poster presentation
P17



Facility AO system

- Laser Guide Star Facility
  - Operation with TBAD started in January, 2025
    - Largely reduced the operational burden of LGS observation
    - Also reduced overhead for LGS setup
    - Optimization of the procedure through engineering observation
      - Implementation and on-sky test of 4LGS mode
        -> Akiyama-san's poster **P24**

Facility AO system

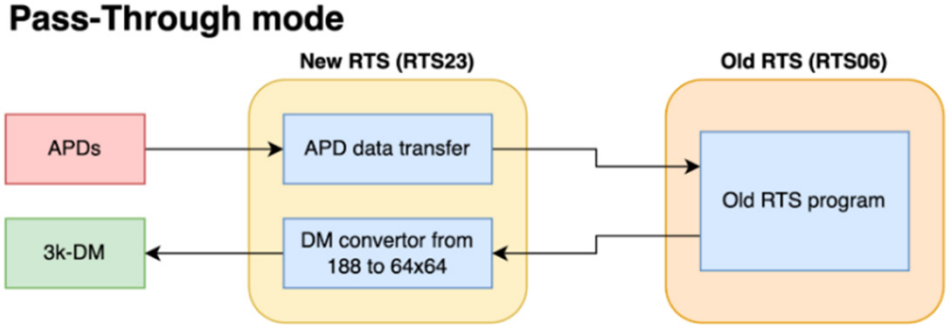
- DM3k upgrade in 2024
  - observing modes

Observing mode	DM	WFS	Instruments
NGS-AO188 mode	DM3k	188 element APD (original HOWFS)	IRCS SCExAO (※) IRD
LGS-AO188 mode	DM3k	188 element APD (original HOWFS)	IRCS IRD
NIR-WFS AO3k mode	DM3k	NIR-WFS (PI device)	IRCS SCExAO (※)

※SCExAO+CHARIS, SCExAO+VAMPIRES, SCExAO+FPDI, REACH

Facility AO system

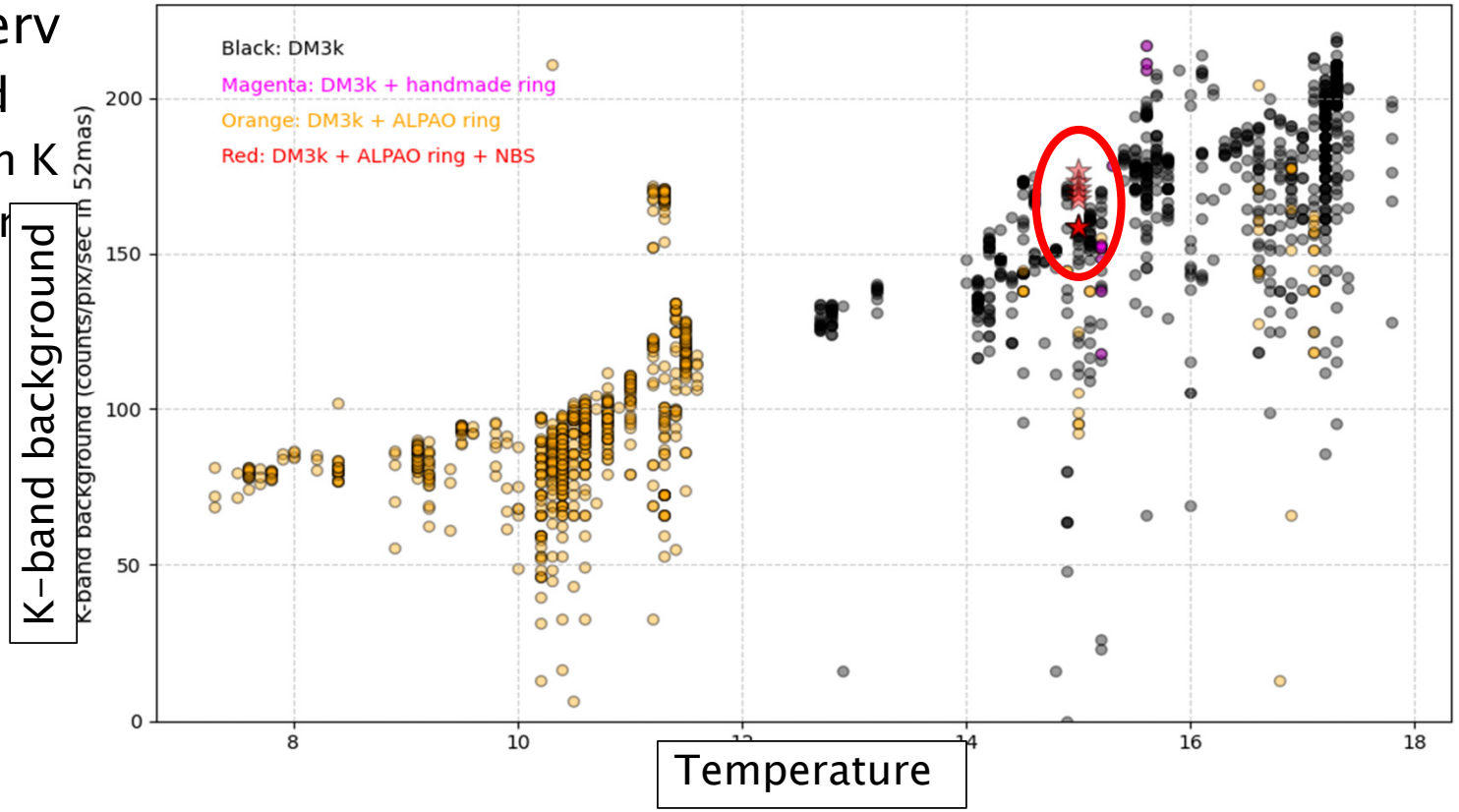
- AO3k/RTS status
  - NGS/LGS-AO188
    - “pass-through mode” for open-use observation (RTS23+RTS06)
    - development and test are ongoing for the non-PT mode (only RTS23)



  - NIRWFS-AO3k
    - heavily used for SCExAO observations
    - also for IRCS observations with optically faint targets
    - poster presentation by Julien Lozi **P29**

IRCS

- Recommissioning after NBS installation
  - Still ongoing
  - Engineering observ
    - IRCS background
      - ~15% increase in K
      - consistent with r
      - need more data



IRCS

- Recommissioning after NBS installation
  - Still ongoing
  - Engineering observation on 11/4-11/5
    - IRCS background
      - ~15% increase in K-band with NBS
      - consistent with model prediction (~18%, UM2024)
      - need more data
- High background issue after DM3k install (in 2024)
  - the issue still exists
  - development of a pupil camera in K-band

HDS

- Mostly stable operation
  - minor issues
    - CCD readout trouble -> replaced the MFront BIAS board (April)
    - slit-length motor didn't move -> happened only once (April)
    - communication problem with I2Cell controller (October)
- HDS-comb (PI device)
  - received the proposal document
    - aiming to install in FY2025
  - poster presentation by Omiya-san **P21**
- HDS-UV
  - Development of ADC+image-slicer unit for UV wavelength (budget application phase)

MOIRCS

- New Filters
  - MBJ2, MBH2, MBK2 (PI: Yusei Koyama)
    - Triple-band MB filter, use with J/H/Ks.
  - BrG_ON and BrG_OFF NB filters (PI: Kumiko Morihana)
    - for high-accuracy BrG EW measurement.
  - Installation and on-sky test were done, analysis ongoing

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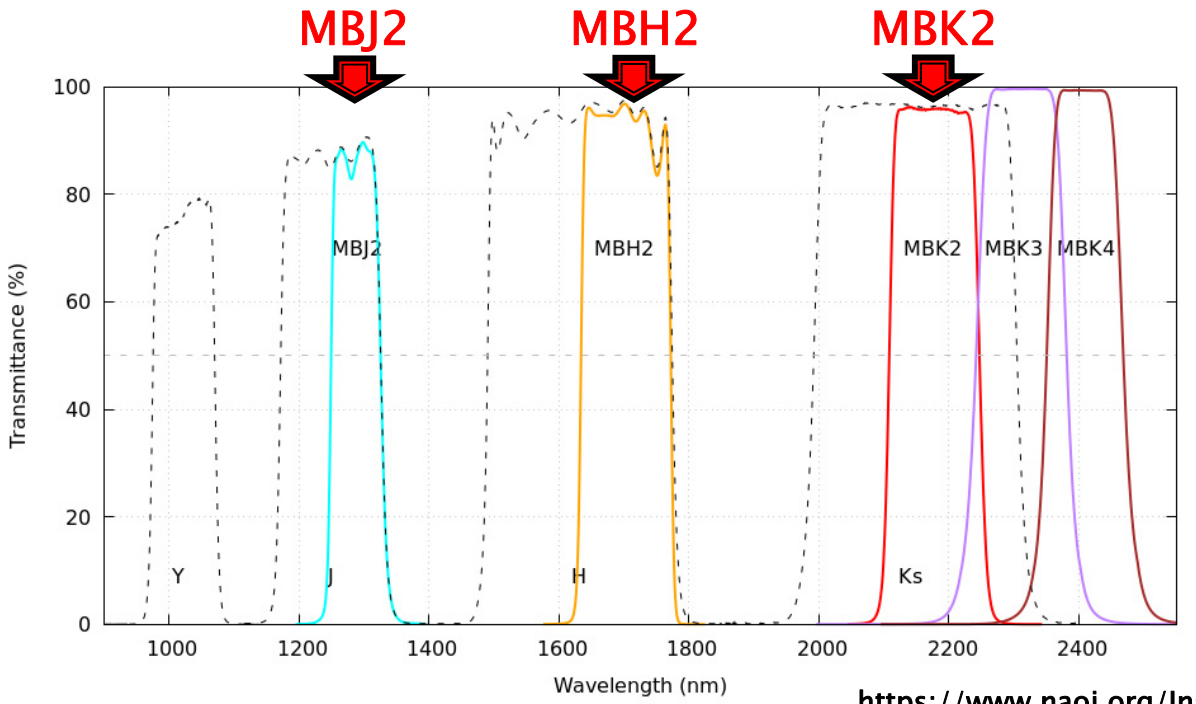

https://www.naoj.org/Instruments/MOIRCS/imag_sensitivity.html

MOIRCS

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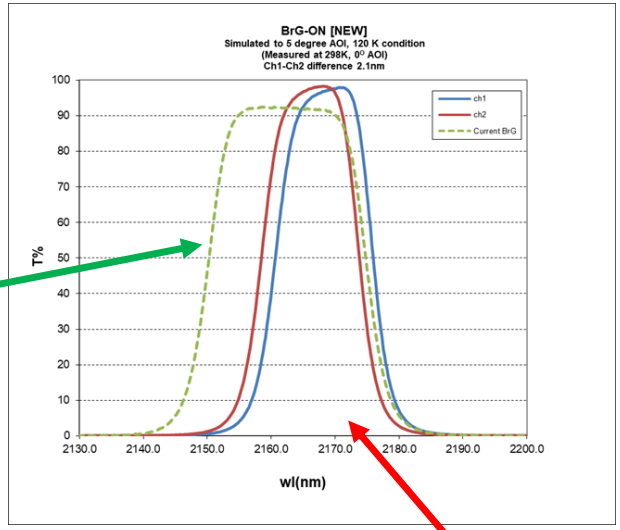
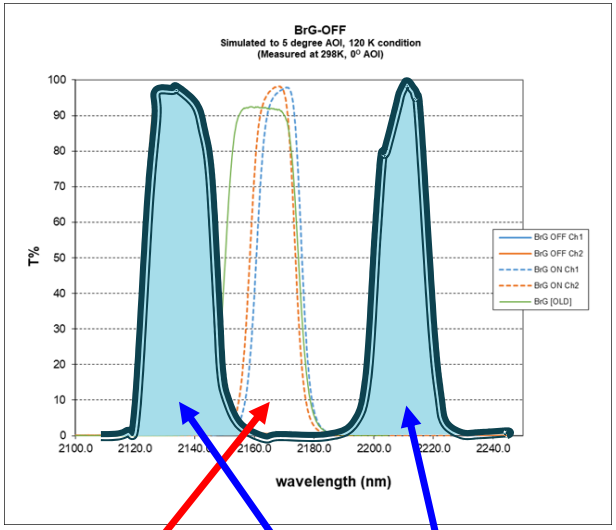
    - for high-accuracy BrG EW measurement.





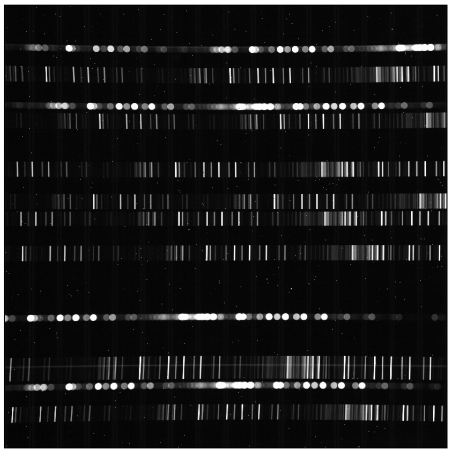
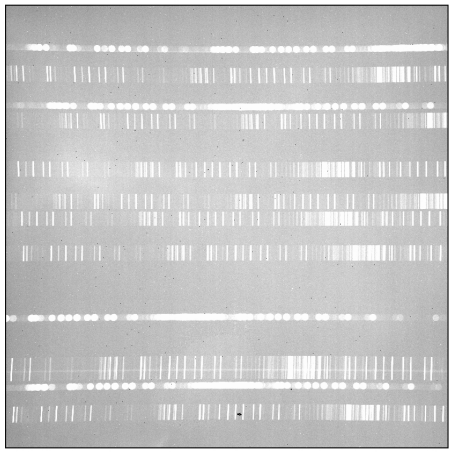
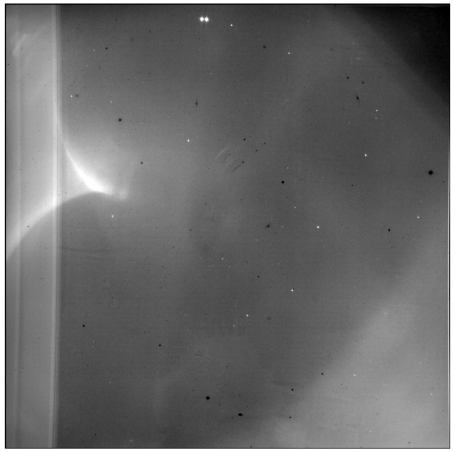
Old BrG Filter

New BrG-ON Filter

New BrG-OFF (dual band) Filter

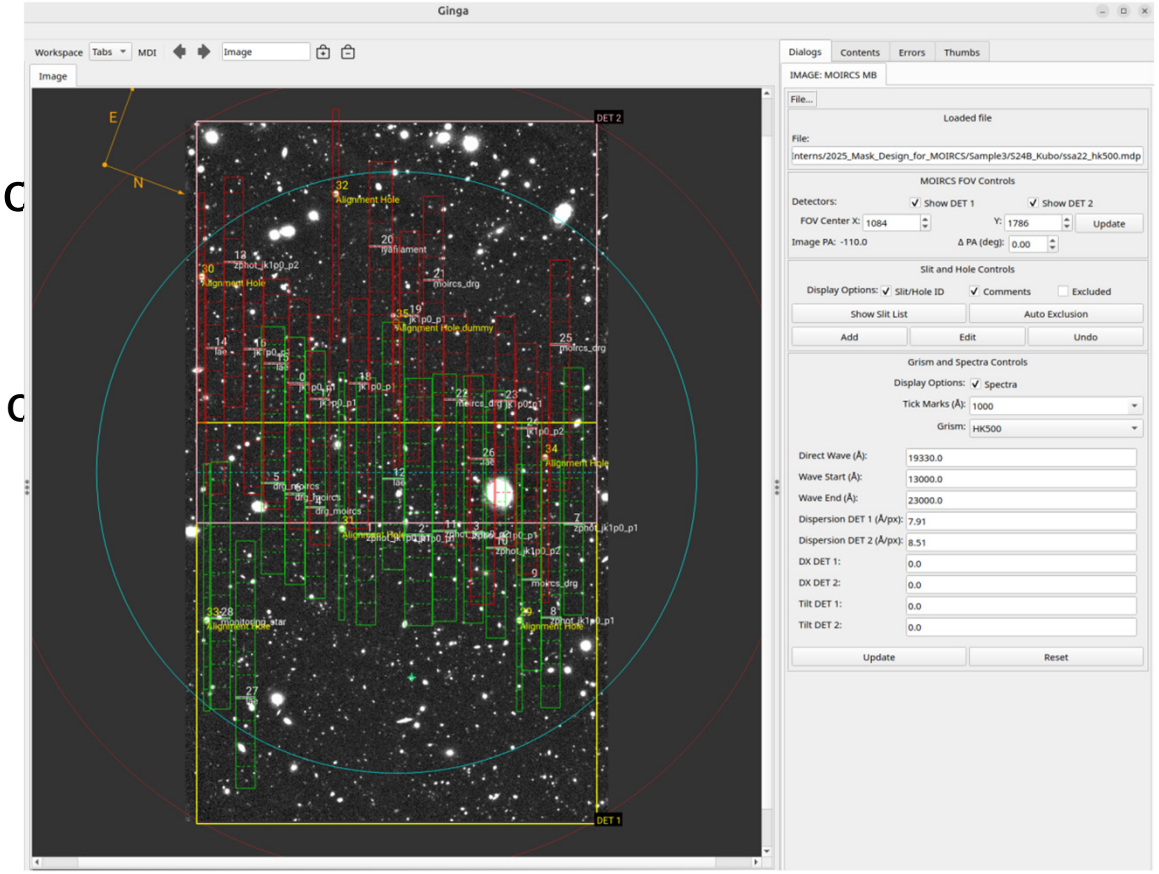
MOIRCS

- Stray light in Ch2
  - Intermittently showing ~hundreds ADUs (up to a few thousands)
  - Noticed recently, but started early 2025?
    - It affected at least three programs in S25AB.
  - The cause is currently under investigation
    - Suspecting one of the turret motor is generating heat
    - A temporal mitigation measure is working for now.

MOIRCS

- Announcement
  - STD_K was out from the dewar.
  - Upgrade of MOS mask design sc
    - by Akamai Intern Program
  - MOS data reduction software
    - Discussion with the PipeIT team c



The new "Minkyeong MDP" MOS mask design software

FOCAS

- No major trouble in 2025
  - Concern on aging hardware
    - OBCP and RAID system
    - on-instrument computer (focas2)
- Tech-IFU
  - New Integral Field Unit for FOCAS
    - mainly for technology demonstration
  - Poster presentation by Ozaki-san **P22**

PI Instruments

- PI Instrument Workshop (10/28)
  - Report in the discussion session on 10/31 (11:15-)
- Poster presentations
  - asked the instrument teams to present the status and plan
    - P17 NBS (Hattori)
    - P20 COMICS (Otsubo)
    - P21 HDS-comb (Omiya)
    - P22 Tech-IFU (Ozaki)
    - P23 IRD, REACH, K-REACH (Kotani)
    - P24 ULTIMATE-START (Akiyama)

PI Instruments

- Poster presentations
  - SCExAO and AO3k
    - P25 CHARIS (Guyon)
    - P26 VAMPIRES (Guyon)
    - P27 Photonic Lantern and **FIRST-PL** (Guyon)
    - P28 GLINT, MEC, SPIDERS, etc. (Guyon)
    - P29 AO3k (Lozi)