Telescope Report

Yutaka Hayano
Telescope Engineering Division
Subaru Telescope, NAOJ

Contents

- Long downtime due to telescope troubles.
- Telescope refurbishment.
- Telescope pointing and tracking performance.
- Staff reassignment due to the strict enforcement of the five-year term limit for A2 visas.

Long downtime due to the telescope trouble in 2025.

- 2025/1/4(Sat)-1/5(Sun) POpt2, primary unit trouble. Recovered by power cycle of local control units (SMCU, FRCU(PF)). The root cause is still investigating. (2 nights)
- 2025/2/13(Thu) IRM2 tip-tilt. Recovered by cable reconnection at the tip-tilt local control unit. (1 night)
- 2025/3/7(Fri)-3/9(Sun) IRM2 error of link reset. Recovered by resetting the limit manually. (3 nights)
- 2025/3/19(Wed) POpt2 trouble. Cable swapping of the hexapod actuator. Resolved by reconnecting the cables correctly and manually resetting the actuator that had reached its limit. (1 night)
- 2025/5/19(Mon) ADC trouble at Prime focus. Poor contact in the cable connector. Recovered by reconnection.(1 night)
- 2025/9/11(Thu) Command sequence stopped when the primary mirror cover was opening. Visually inspected the mirror cover, then opened the covers individually. (52min)
- 2025/10/19(Sun) Azimuth encoder alarm. Recovered by reconnecting the cable. (86 min)

Status of telescope refurbishment.

- Completed items
  - M1 coating chamber control system. M1 washing machine facility.
- Continuing items
  - Telescope tracking system. Dome rotation system. Dome sealing. Dome wall paint. Dome motion control system.
- Planned items
  - OptM3 recoating (2025.12, 2 nights downtime). IRM3 recoating (2026, 2 nights downtime). Top unit spider connectors (2026). Primary mirror recoating (2027, ~2.5 months downtime).

Mirror washing machine refurbishment

Major items of future telescope refurbishment

- Primary focus unit (POpt2) overhaul.
- Top unit exchanger control sequence upgrade.
- Secondary mirror overhaul.
- Primary mirror actuator refurbishment.
- Upgrade of motor drivers (Auto guider probes, instrument rotators, ADCs etc.)
- Auto guider, slit viewer, Shack-Hartmann sensor refurbishment.
- Telescope control system.

Worse pointing and unstable tracking.

- Pointing error has become larger.
  - Targets could not be acquired for SCExAO and IRD.
  - The issue has been resolved by conducting a single PA (NsIR/IRM2) in March.
- Unstable tracking has been reported when the tracking speed is small.
  - Crossing the meridian, when the racking speed of EL is small.
  - Specific sky when the tracking speed of Az is small.
  - Unstable tracking at low speed of AZ and EL is still under investigation. We will have an on-sky test on October 29, 2025.
  - Updating the calibration table (the compensation data) has improved the position error in AZ and EL.
- If you have any requests or concerns about the telescope performance, please give us feedback after the observation through an open-use report.

Personnel change in the telescope division.

- 5 members of the telescope division will leave Hawaii by the end of July 2025.
- 3 members will be assigned to Hawaii. The first person will be in December 2025. Others will be around March 2025.

- The importance of handover procedures for new staff and remote support scheme is increasing.

Summary

- The occurrences of long downtime seems to be decreasing.
- Telescope refurbishment is continuing.
- M3 (optical and infrared) recoating in Dec. 2025 and 2026.
- Revisions of refurbishment future plan is progressing.
- Worse pointing at NsIR has been resolved by single PA.
- Unstable tracking is still under investigation.
- Five members will be back to Japan in 2026. And, three members are assigned to Hawaii from December 2025.
- Any comments or concerns regarding the telescope's performance are welcome.