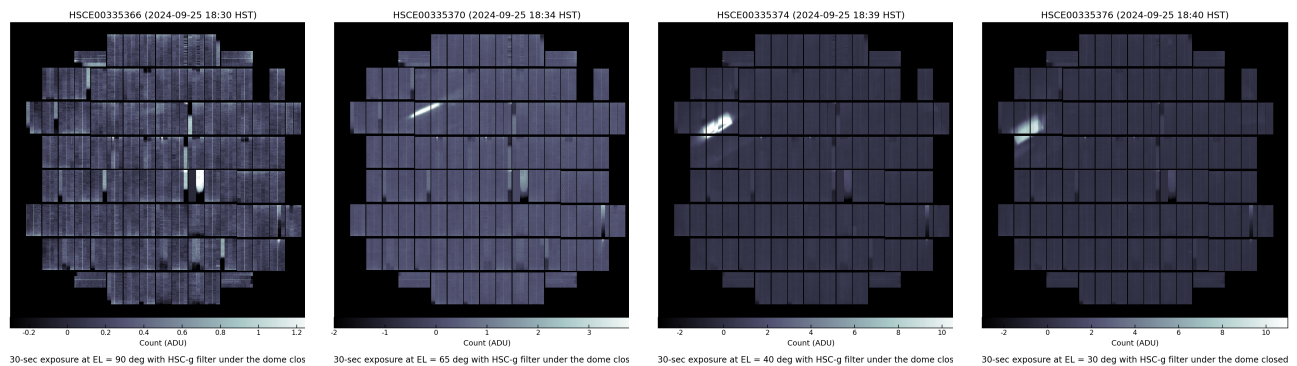


Stray light issues in HSC images on the nights of Sep 24–25, 2024 HST

T. Terai (Subaru Telescope)

October 21, 2024

- Arc-shaped stray light was seen in HSC images through the nights of September 24 and 25, 2024 HST.
 - It appeared in the images taken with the g -band filter at elevation (EL) lower than $\sim 70^\circ$.
 - The position roughly moved with the instrument rotator angle.
 - Considering these characteristics, it was suspected that the source of the stray light was located inside of the dome.
- On the evening (after sunset) of Sep 25 HST, we took test exposures with the g -band at several ELs (90° , 75° , 65° , 50° , 40° , and 30°) under a dark condition with the dome shutter closed.
 - Stray light was clearly seen in HSC images taken at $EL < 70^\circ$.
 - The intensity was roughly higher at lower EL though it was not monotonically and highest at $EL = 40^\circ$.
 - The stray light appeared even when the covers of the primary mirror closed.
 - Another test exposure taken with the z -band filter showed no unknown stray light.
 - We concluded that the light source was likely to be in the dome.
 - Eye inspection by a Telescope Operator using Night Vision couldn't identify the light source.



$EL = 90^\circ$

$EL = 65^\circ$

$EL = 40^\circ$

$EL = 30^\circ$

- On the daytime of Sep 26 HST, Telescope Engineers performed light leak investigation and found one of the pressure gauges for monitoring the hydrostatic bearing at NsOpt was emitting light.
 - The light could directly reach POpt2's lens, though it was hard to be seen from the observation floor.
 - The gauge's display part had been exposed probably since late August. It was covered.
 - We confirmed that the stray light disappeared afterward.