Investigation of stray light on HSC images

November 15, 2019

- A large, arc-shaped ghost had appeared on some HSC images since the late February 2019.
  - The ghost is seen in 900 or more frames obtained from Feb 27 to Nov 5 with the $i_2$, $z$, $Y$, and $NB921$ filters. It appears most significantly in the $z$-band images.
  - The ghost tends to appear at relatively low elevations around $40^\circ-50^\circ$. The pattern varies with elevation (EL) and rotates with the instrument rotator angle (InR).

- On investigation, the stray light source was identified as a dome inside monitoring camera at the rear side installed in late February 2019. This camera was confirmed to emit infrared light from the circumference of its lens.

- The camera was powered down on the morning of Nov 6. The ghost has disappeared since then (the remnant pattern is due to a light leak from the encoder of instrument rotator that is a known problem).

z-band, EL=42°, InR=58°  
z-band, EL=49°, InR=53°

z-band, EL=42°, InR=15°, dome closed  
Same imaging after the rear camera was covered