Wide Field Camera 3 (WFC3) is a fourth-generation imaging instrument installed on the Hubble Space Telescope during Servicing Mission 4 in 2009. WFC3 features two independent channels: the Ultraviolet-Visible channel (UVIS), sensitive to 200–1000 nm, with a pair of ~2 × 4 KCCDs, and the Infrared channel (IR), sensitive to near-IR approximately 800–1700 nm, with a ~1 K HgCdTe array. WFC3 has been performing extremely well over its 15 years on-orbit, although each detector has characteristics that can affect the precision of astronomical measurements and thus require calibration. For example, the UVIS CCDs experience charge transfer efficiency losses due to radiation damage from the orbital environment, as well as dark current and hot pixel growth. UVIS also exhibits a small number of anomalous pixels referred to as sink pixels and low-level pixel-to-pixel quantum efficiency fluctuations. The IR focal plane array exhibits persistence, hotbad pixels, and snowballs. All the detector systems are well-characterized and routinely monitored, with calibration and/or mitigation strategies updated as needed. Here we discuss some of the UVIS and IR detector systematics as well as the pre- and post-observation techniques we employ to mitigate their effects.

### UVIS DARK CURRENT & HOT PIXELS
- UVIS uses buried channels and multi-phase pinned technologies to help lower dark current and improve charge transfer.
- Two to four 900s dark current exposures are taken every day.
- Since Nov. 12, 2020, we use a 20 e−-post-flash to mitigate CTE losses.
- Roughly 1000 dark pixels accumulate per day but a fraction of them are "repaired" via the annealing process [14].

### UVIS HYSTERESIS
- UVIS exhibits occasional low-level hysterisis across both CCDs (up to 4%) immediately after the anneal.
- To check for any QE deficit (and automatically mitigate if necessary), every three days the detector is saturated with a 200s F475X flat-field where pixels reach ~2.3 times full-well saturation.
- Nominal image ratio with no hysterisis. [13]
- Three image ratios containing hysterisis (all after an anneal). [13]

### UVIS QE PIXEL VARIATIONS
- A small (few percent) evolving population of pixels with lower sensitivity develops between anneals.
- Pixels deviating by more than 2–3% from 0.1% in F814W and F438W and from ~3% up to ~10% in F225W [6].
- Warming the detector to ~20°C successfully recovers most low-sensitivity pixels although some, like blue wavelengths, require multiple anneals.

The number of F814W low-sensitivity pixels with vals < 1%. [5]

### IR SNOWBALLS
- Snowballs are bright, transient, extended sources that typically affect ~10 pixels, contain ~10⁶ e−, and saturate ~2–5 pixels.
- Like CTDs, snowballs generally affect one detector read making them easily rejected during the "up-the-ramp" fit in the calw3 pipeline.
- Occurrence rate is roughly 1 snowball per hour of exposure time.
- Seen in other detectors such as WST [3,12], Eudid [1], and Roman [1].
- U-238 e−-decay from detector or bonding material causing snowballs?? [10]

Example snowball. Left: region of one read containing snowball. Middle: saturated pixel map, and Right: flux map, red = saturation. [15]

### REFERENCES