



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

WFC3

S. Baggett

STUC, May 13-14, 2019



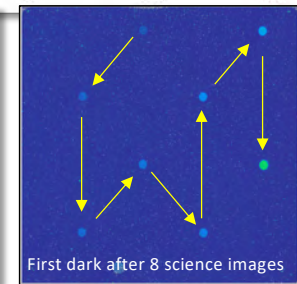
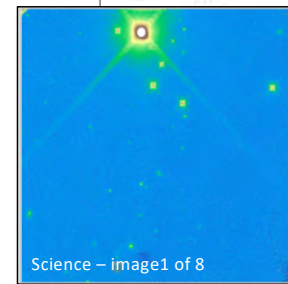
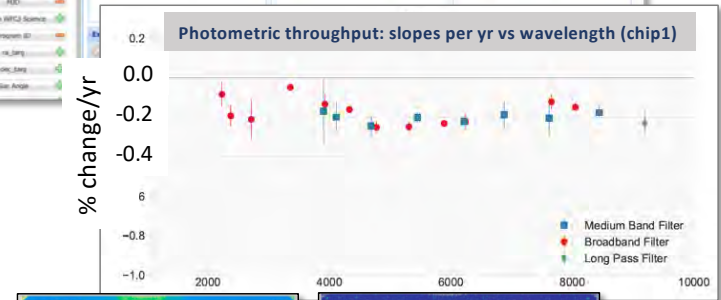
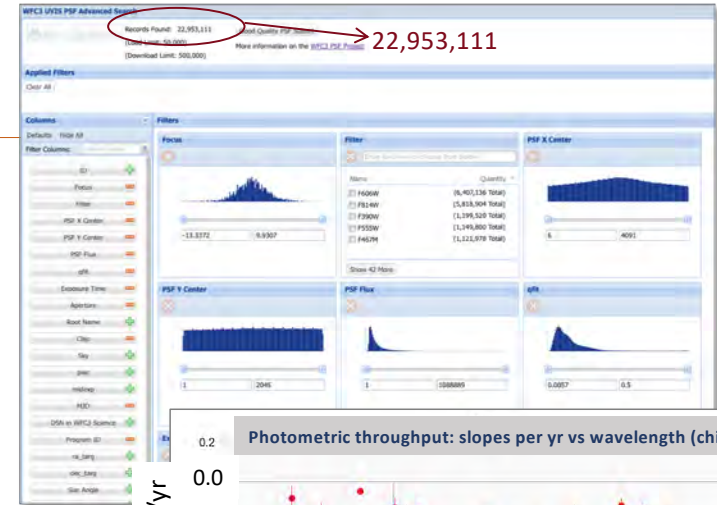
WFC3 status/completed projects

Status

- WFC3 operating nominally
- Jan 8, 2019: suspend event
- Apr 9, 2019: image 245,000 (15665, PI de Pater)
- May 29, 2019: **10 years on-orbit operation**

Completed

- UVIS PSFs added to MAST PSF Library (now: ~23 million)
- UVIS sensitivity decreasing: 0.1-0.3% /yr (ISR 2018-16)
- IR count-rate non-linearity: precision improved by x5
→ should allow ~1% Hubble constant (ISR 2019-01)
- Short-term persistence
power-law decay, steeper at longer times (ISR 2019-02)





WFC3 completed/ongoing projects, cont'd

Reclaiming hot pixels

Done – in pipeline

- UVIS: ~95% of hot pixels are stable (ISR 2018-15)
- IR: ~200 new hot pix/yr, 3.5% pixels changed/10yrs
→ DQ flag 32 for unstable (hot remain 16; ISR 2019-03)
- Updated bpix tables, superdarks, MDRIZTABs (ISRs 2019-04,-05)

Astrometric updates

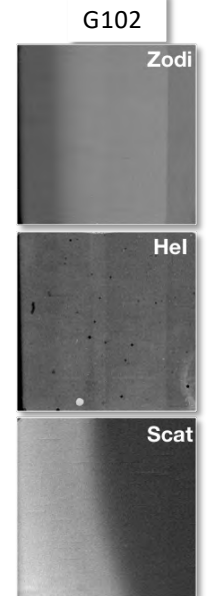
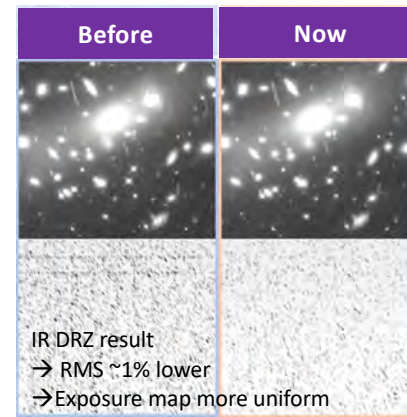
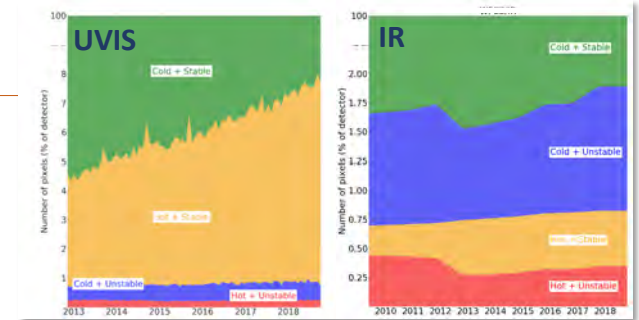
Mid-May release

- MAST/software teams database: improve absolute astrometry a priori, a posteriori solutions in image headerlets
- transitioning of HLA

IR grism background modelling

~June release

- Background subtraction is the limiting factor
Added variable HeI & scattered light components, improving S/N in Zodi/HeI models





WFC3 ongoing projects, cont'd

This summer

High-precision photometry via spatial scans

ISR in prep

- User tools in python available on github

Release of IR MAST PSF Library

Python tools for using PSFs / PSF DB

Update to UVIS CTE correction

- Standalone code done; next: implement, test, install

Update to IR skyflats

Cycle 27 Phase II user support

Cycle 27 calibration plan

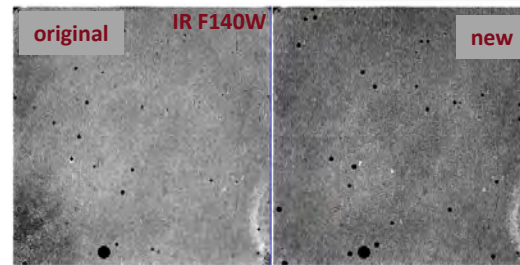
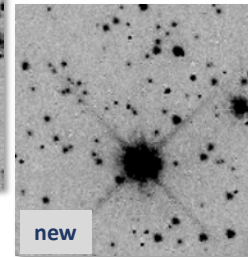
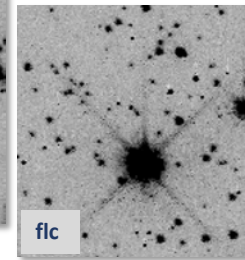
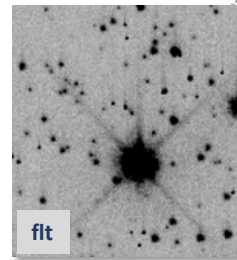
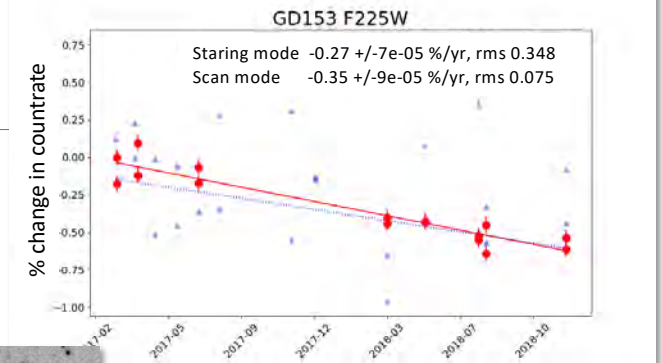
Longer term

UVIS time-dependent zeropoints

Improvements to IR up-the-ramp fitting

IR zeropoint updates

Other? suggestions welcome





New Documentation

- Vetting of IHB conversion to Hdox – June release
- STAN in Jan 2019, next one ~June
- Drizzlepac notebook tutorials (Jan 2019)
- Instrument Science reports

[ISR 2019-05: Improved Drizzled Data Products for the WFC3/IR Detector](#) – J.Mack & V.Bajaj

[ISR 2019-04: Time-dependent WFC3/IR Superdarks](#) - B.Sunnquist, M. Mckay, S. Baggett

[ISR 2019-03: Time-dependent WFC3/IR Bad Pixel Tables](#)- B.Sunnquist, G. Brammer, S. Baggett

[ISR 2019-02: A characterization of persistence at short times in the WFC3/IR detector. II](#) – M. Gennaro, S. Baggett, V. Bajaj

[ISR 2019-01: Calibration of the WFC3-IR Count-rate Nonlinearity, Sub-percent Accuracy for a Factor of a Million in Flux](#)
A. G. Riess, Gautham Narayan, Annalisa Calamida 25 Jan 2019

[ISR 2018-17: WFC3/UVIS Gain Stability Results for Cycles 24 and 25](#) -J. Fowler 24 Oct 2018

[ISR 2018-16: WFC3/UVIS - Temporal and Spatial Variations in Photometry](#) - H. Khandrika, S. Deustua, J. Mack 08 Nov 2018

[ISR 2018-15: Using Dark Images to Characterize Pixel Stability in the WFC3/UVIS Detector](#) - M. Bourque, D. Borncamp, S. Baggett, T. Desjardins, N. Grogin
20 Dec 2018

[ISR 2018-06: WFC3/IR Blob Monitoring](#) - B. Sunnquist, updated last: May 2019

[CSM offsets](#) | [Blob Summary](#)

