STIS Update

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for the STIS Team
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Recently Completed Work

Documentation:
- ISR 2019-01: A New Method to Monitor the HST/STIS Focus
- **ISR 2019-02: Identifying Jitter Induced CCD CR-SPLIT Combination Errors**
- ISR 2019-03 (x-post from JATIS): Pushing the Limits of the Coronagraphic Occulters on STIS
- Migration of IHB to HDox, Data Handbook next

Instrument Support:
- Delivery of new NUV dark reference files (see last STUC presentation)
- **New UV Time Dependent Sensitivity reference files (1-4% improvements)**
- Jitter impacts to coronagraphy (ISR in review)
- Updates to enclosed energy curves in first order modes for ETC (See ISR 2018-06)
Updates to the TDS-Reference files delivered!

NUV-MAMA departing from spec: 2-4% improvements

NUV/CCD: <1% improvements

CCD: <1% improvements

FUV-MAMA: 2% improvements

Also reflects updates to TDS monitoring code to decrease systematics
The impact of Jitter on Coronagraphy

Monitoring Contrast vs. Jitter

- FGS, WFC3 ePSF fitting, and Coronagraphic centroiding all result in consistent measures of jitter
- Gyro 2-4-6 combination in 2018 increased jitter and degraded contrast
- ISR is under review
- Future work: track impact to contrast across full range of jitter values
Determining the impact of Jitter on combining CR-SPLIT Spectra

- Jitter >7 mas can cause CR rejection algorithm to fail
- Users need a way to tell if this has happened
  - Look at jitter files
  - Use new *stistools* package `crrej_exam`
- ISR published
Future Work in FY20

• Rapid completion of instrument reviews to aid in scheduling
• Complete E140M flux recalibration
• Complete investigation of spatial scanning for transiting exoplanet science
• Complete Fringe Flat Tool—to create a more user friendly tool in Python, and study the utility of a generic fringe correction
  • Coding sprint was delayed until late FY19, sprint completed and code being finalized for verification and testing
• Echelle Dispersion Monitor Revamp—assess need for legacy wavelength dispersion solutions+leverage against external calibration program by PI Ayres (Program 15948)
• Push absolute flux calibration of first order modes towards 1%
Cycle 27 Calibration Program Relevant to the Community

Special Programs

16028: Absolute Flux Calibration of STIS FUV-MAMA G140L and NUV-MAMA G230L

- Attempt to track down sub-requirement systematics in first order UV gratings with goal of flux calibrations approaching <1% across the history of STIS

1998 May

2017 April
Obtain high SNR spectra for primary calibrators of STIS/COS

This will:
•  Improve the CALSPEC SEDs of WD 0308 (all gratings), WD 1057 (adds G750L), and WD 1657
•  Improve WD modeling
•  Reduce the absolute flux uncertainty from ~5% (e.g. G140L/G230L overlap) to 1-2%
•  improve precision of time-dependent sensitivity

Why 3 WDs?
•  provides calibration cross-checks in the critical FUV and NUV range