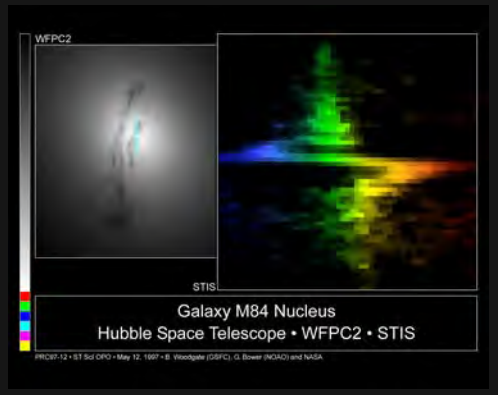
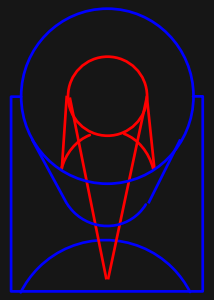
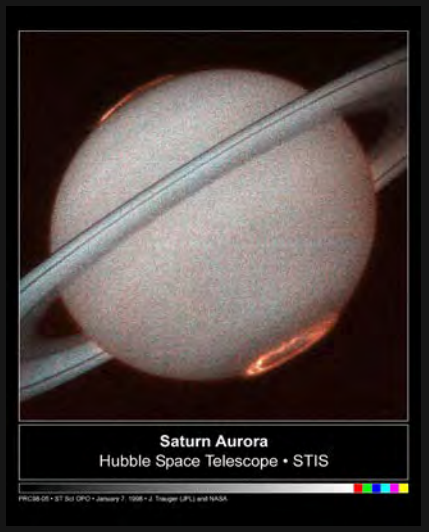
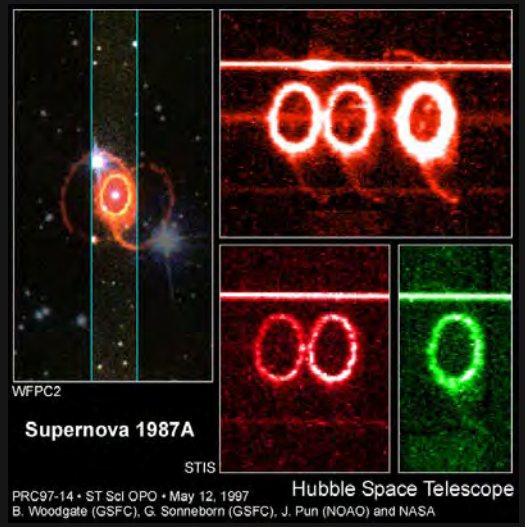




STIS Closeout Plan

Paul Goudfrooij





Space Telescope Users Committee, 11/18/2004

Closeout Plan Setup

- Activities divided into “Blocks”, led by Block Head and Lead DA. Backups are assigned for each as well:
  - Team management
  - Calibration
  - Pipeline
  - Archive Enhancement
  - User Support (mostly Help Desk support from now on)
  - Information (Web site / User Documentation)
  - SM4 *(no activities accounted for as yet, but SM4 team @ GSFC **will** examine requirements necessary for repairing STIS)*
- Assigned estimated FTE load, % users aided, and Priority to each activity
- Only subset of activities presented here; remaining ones are included in the written Closeout Plan and Excel spreadsheet

Calibration Activities

- Two main categories of activities:
  1. Closeout analysis of long-term monitoring CAL program data
  2. Analysis of “Special” CAL programs from Cycles 11 & 12
- Determine final calibration parameters and methods; prepare and deliver Calibration Reference Files to OPUS/CDBS
- Publish results in ISRs or TIRs

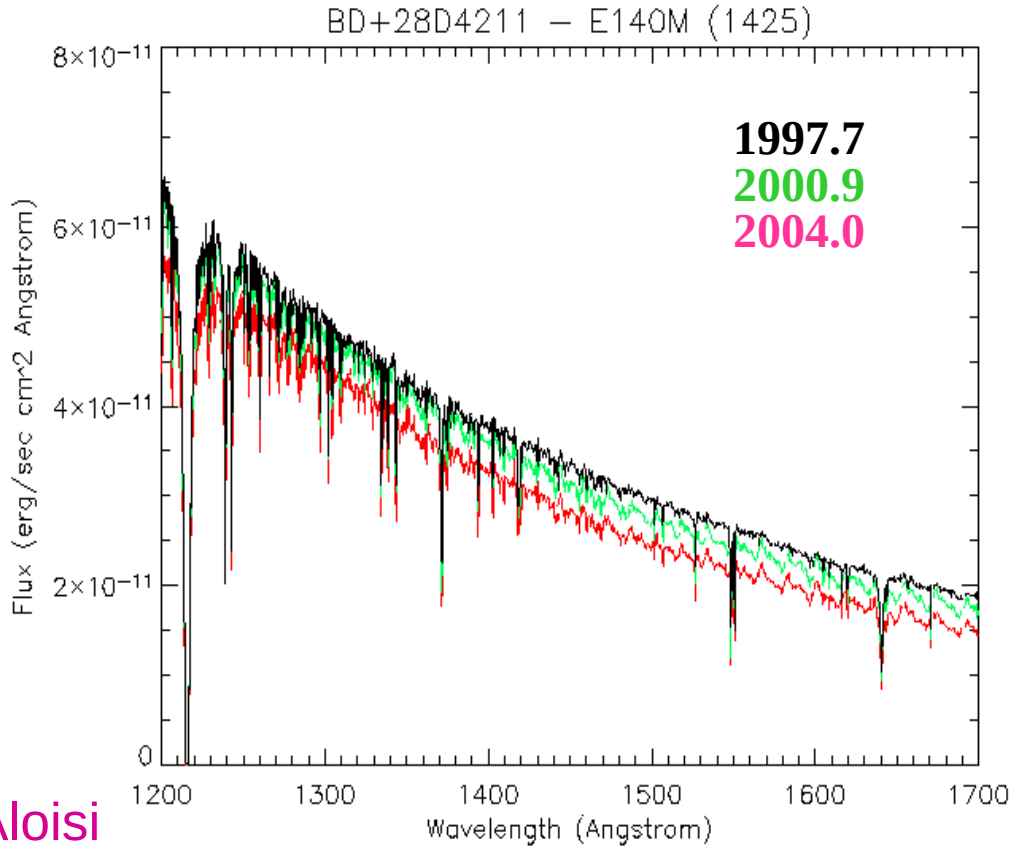
“Special” Calibration Example

- **Echelle-mode Sensitivities** (PRIORITY: Crucial)
  - Prepare and deliver final sensitivity calibrations for E-modes using all CAL data collected through Aug 2004
  - Specs on Flux calibration (5% rel.) not achieved for last few HST cycles
  - Significant, multi-faceted effort:
    - Global, λ-dependent change in sensitivity
      - Time dependence of sensitivity to be compared with that in place for the first-order modes and implemented (requires newly formatted photometric throughput reference file)
    - Blaze shift correction as a function of ‘monthly offset’
      - Blaze shift ≠ wavelength shift due to monthly MSM offsets
      - IDT correction by Bowers & Lindler implemented 09/02
    - Two significant shortcomings:
      - Blaze correction In place for primary λ_c only, not for secondary
      - Time dependence of blaze shift correction is (currently) incorrect
      - Synphot reference files do not include blaze function for E modes…

“Special” Calibration Example

Echelle modes: Time-dependent sensitivity

Note global sensitivity decrease *and* local deterioration of flux calibration with time



Plot by Alessandra Aloisi

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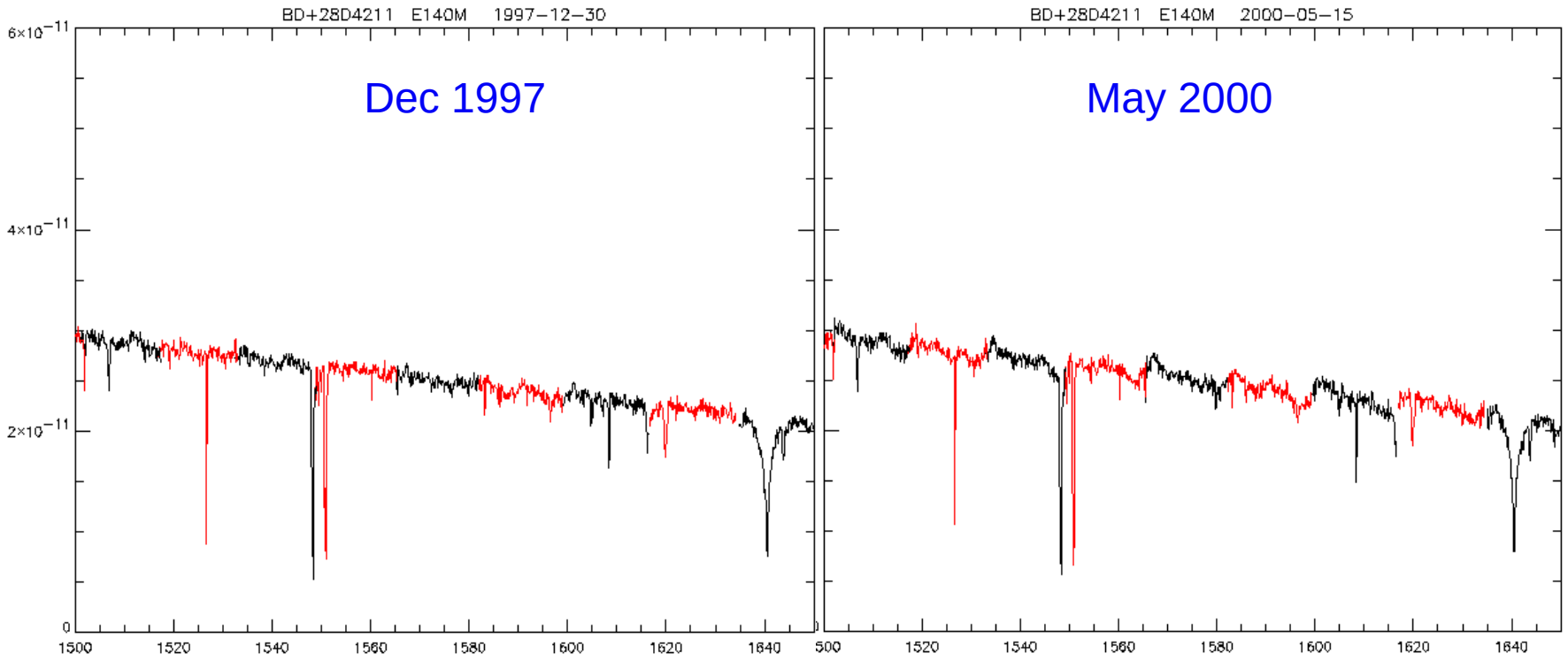
“Special” Calibration Example

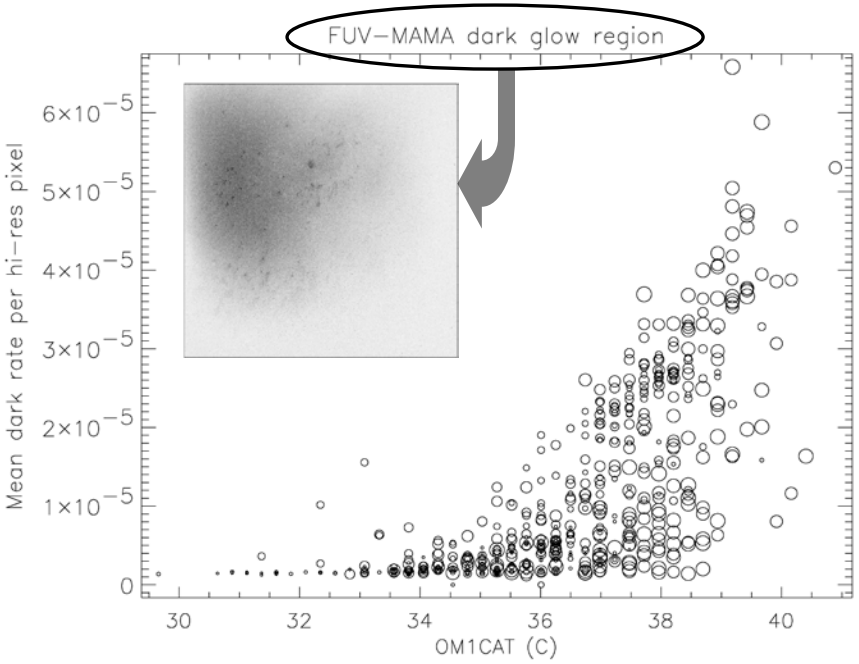
- Echelle modes: Time dependence of blaze shift correction

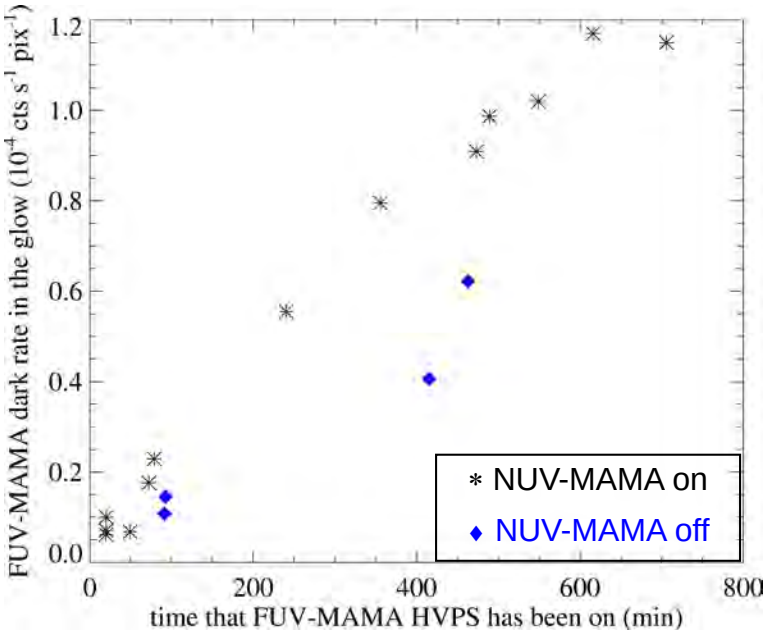


Plot by Jeff Valenti & Alessandra Aloisi

“Closeout” Calibration Example

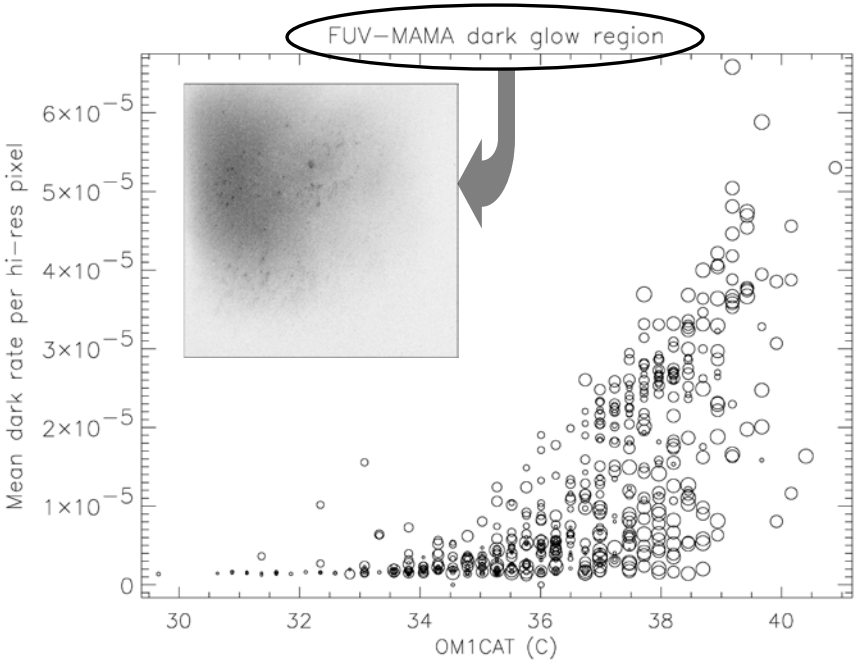
- FUV-MAMA Dark Correction (PRIORITY: High)
  - FUV-MAMA dark in “glow” region generally increasing w/ Charge Amp temp and time since HV turn-on, but so far not easily (nor thoroughly) parameterized; Also, engineering telemetry needed. Effect is significant during recent cycles

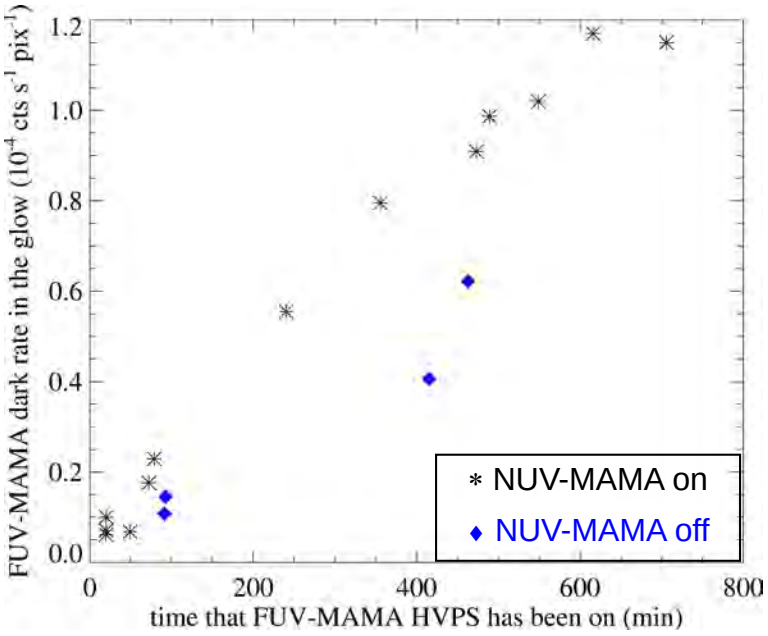




“Closeout” Calibration Example

- FUV-MAMA Dark Correction (continued)
  - For “heritage” instrument, correction can be implemented using table containing turn-on times from engineering telemetry
  - (Likely) Products: New Reference Files; *CALSTIS code change*





“Closeout” Calibration Example

- Closeout of CCD CTE CAL programs (PRIORITY: High)
  - Internal Sparse Field Program (lamp exposures, no background)
  - External Sparse Field Program (typical point source exposures)
  - Extended Source Program
    - Imaging (effect on luminosity, ellipticity, PA at a given μ_V)
    - Spectroscopy (effect on continuum, em. lines, abs. lines and EWs)
  - Last epoch’s data to be analyzed; Results to be compared with current algorithm coefficients
  - Products:
    - ISR
    - PASP paper
    - Update to CCDTAB reference file (if needed)
    - IRAF/STSDAS table to correct photometry tables (for imaging)

Example Calibration due to ST-ECF Funding Issue

- STIS-CE (Calibration Enhancement) Project will be cut short in 2005 due to ST-ECF funding cut by ESA
  - Need to take over (or back) some important projects
- MAMA First-Order Dispersion Solutions (PRIORITY: High)
  - CAL program to test accuracy of wavelength solutions for *all* primary and secondary central wavelengths, using the new Pt/Cr-Ne line list delivered by the ECF.
  - Products:
    - ISR
    - Updated _dsp Reference Files (if needed)
    - Updated _pht Reference Files (if needed)

Major Pipeline Block Activities

- Final Calibration of STIS Data (PRIORITY: High)
  - Comprehensive run of all STIS data through OTFR pipeline to produce final, static archive of raw & calibrated datasets
    - To be run after all final calibrations, coding updates, and reference files have been tested and delivered to OPUS/CDBS.
    - OTFR can then be switched off for STIS use, making more processing power available for OTFR requests of active HST instruments.

‘TBD’ Pipeline Block Activities

- Spectroscopic MultiDrizzle (PRIORITY: High/TBD)
  - To allow handling of dithered spectroscopic STIS data
    - Along-slit vs. across-slit dithers have different image scales
    - To involve dedicated software and reference files to allow corrections depending on detector, grating and aperture.
  - Significant effort, but would constitute unique data analysis resource and likely very highly appreciated by community
  - Products: ISR; New, dedicated Reference Files
- ECF Physical Model-based CTE correction (PRIORITY: TBD)
  - Currently: Cost/benefit study regarding the implementation of physical model-based CTE correction code in pipeline
    - Correction based on a physical model of the STIS CCD (material / known charge traps; readout speed etc. (by Paul Bristow @ ECF))
    - Pipeline implementation would require rebuild of (all) CCD superbias and superdark reference files as well as making the code run more efficiently in terms of CPU cycles

Major Archive Enhancement Activities

- Spectroscopic Preview Enhancement (PRIORITY: High)
  - Review and improvement of “preview” facility available within MAST/HST retrieval pages
    - Several aspects that need improvement (e.g., sky subtraction, display parameters, “not available” error messages)
    - Products: ISR; Coding for web interface
    - Requires Archive Branch resources
- GO Wavecal Association (PRIORITY: High)
  - Development of system within OPUS and Archive to associate STIS GO wavecals with the appropriate science spectra for automatic retrieval

Information Block Activities

- Final Data Handbook Update (PRIORITY: High)
  - Review and update of STIS Chapter of HST Data Handbook
    - Last update made before a number of significant pipeline updates and stand-alone STSDAS tasks were released
    - To include more complete “cookbook” to guide users in routine analysis of STIS spectral data
- Summary Document (TIR): The STIS Experience (PRIORITY: High)
  - Summary of experience with operation and calibration of STIS, to provide easy reference for comparison with operations of other (current and future) SIs.
  - Separate sections on (e.g.) MAMAs, CCD, Lamps / Optics