# ST-ECF Activities

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ST-ECF

Activities 2009

- First release of ACS slitless spectra in HLA
- Support and calibration of WFC3 slitless modes
- HST archive – cached datasets
- Slitless simulations for ESA EUCLID mission
- Outreach
- ECF closes Dec 2010 - handover preparations
- *Science with the Hubble Space Telescope – III.* ESA/NASA conference, October 11-14, Venice

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HLA activities

- **~170** data sets (associations)

- **~54,000** spectra at S/N>2

- PHLAG pipeline: archive retrieval, multi-drizzle combination, Sextractor on direct images, aXe extraction, QC parameters, data & metadata ingestion

- Visual QC on spectra subsamples + neural network based automated classification for final release

- Sample release in HLA (May 09) from 2 NICMOS parallel pointings in GOODS-S

- Final release (~30,000 spectra) planned for end of March 2010: processing completed, QC underway
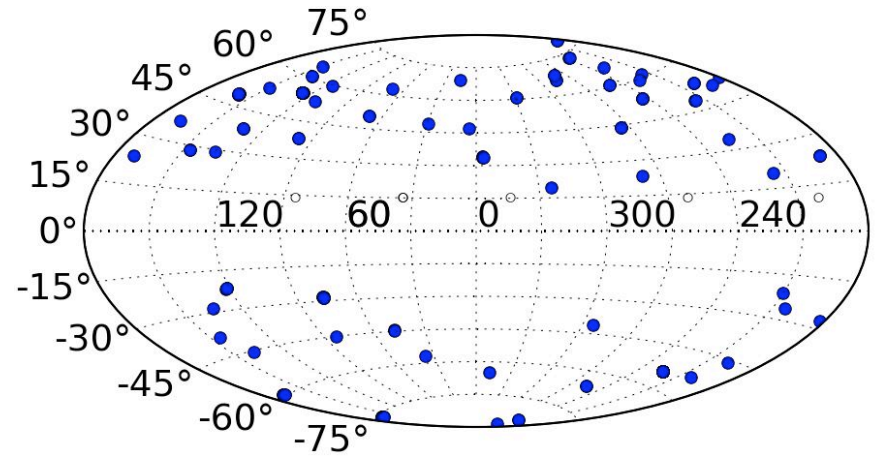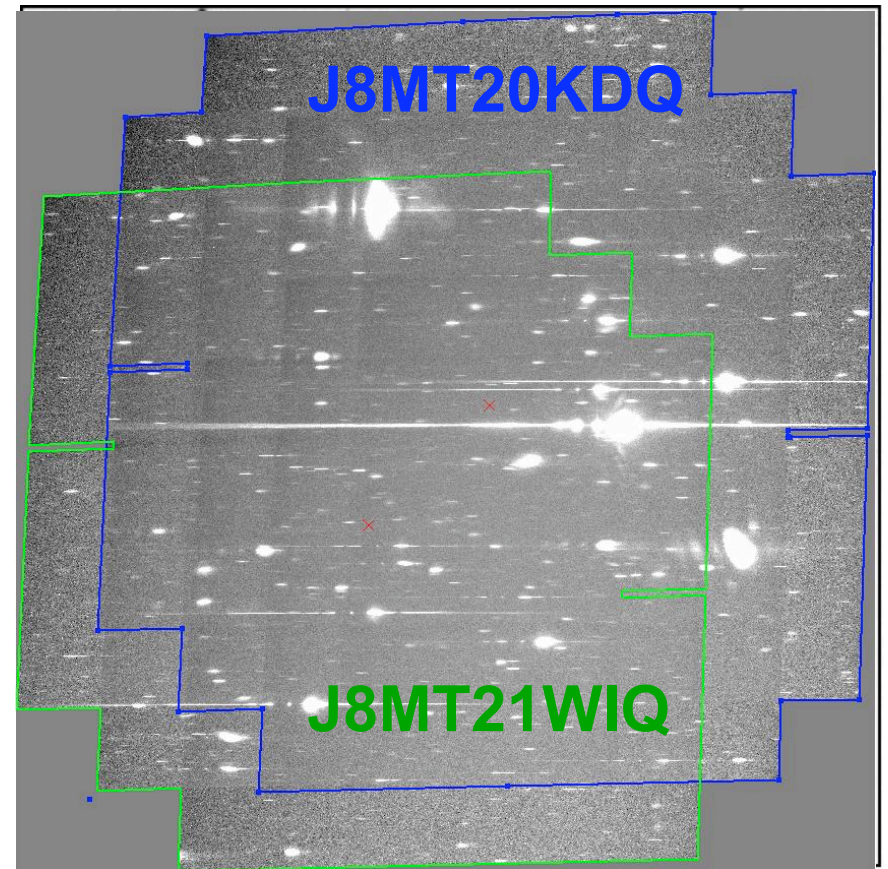
Sample release: UDF NICMOS parallels

- First sampler of 1235 spectra (SNR >= 3)

- ~40% of spectra excluded because contaminated

- Unpublished grism data in a region with a very rich multi-λ data set

- UDF Parallels are combined associations (with different PA):

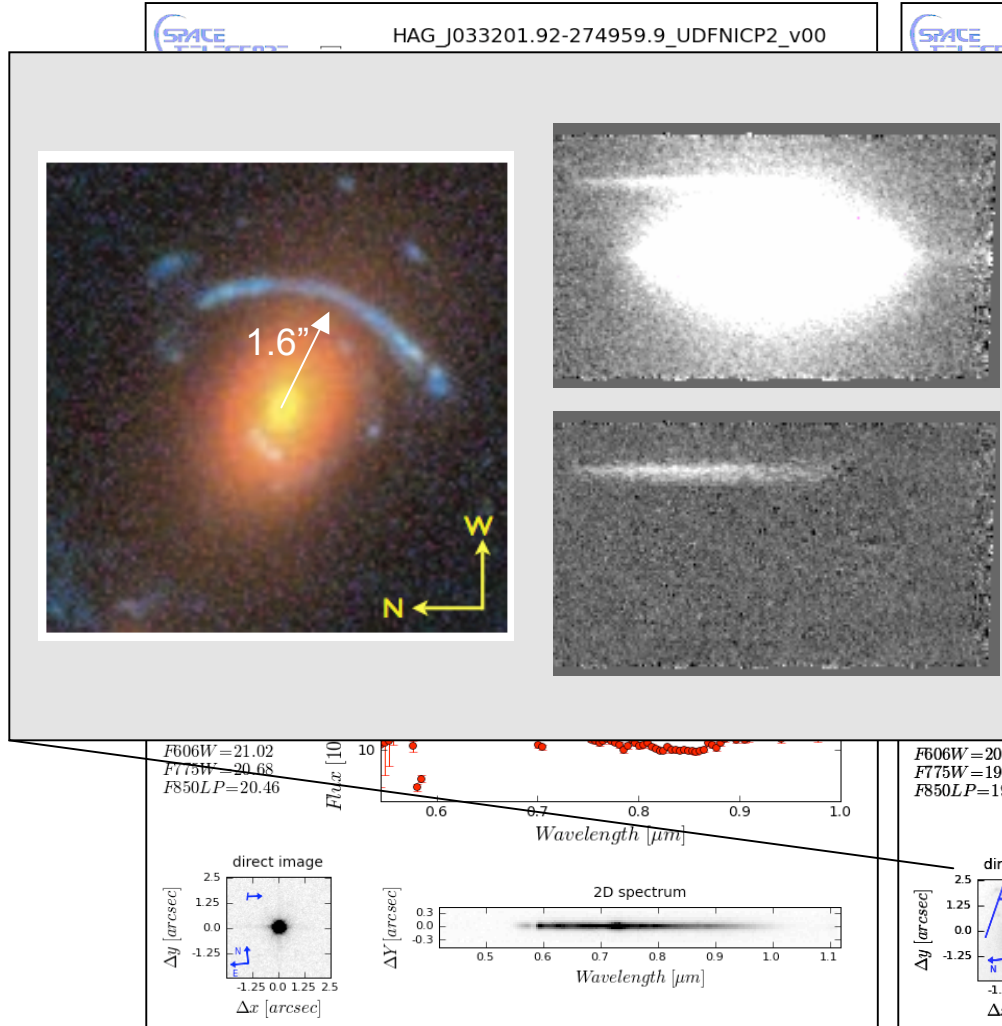 UNFNICP1=J8MT20KDQ+J8MT21WIQ

  UNFNICP2=J8MT43HEQ+J8MT44JBQ

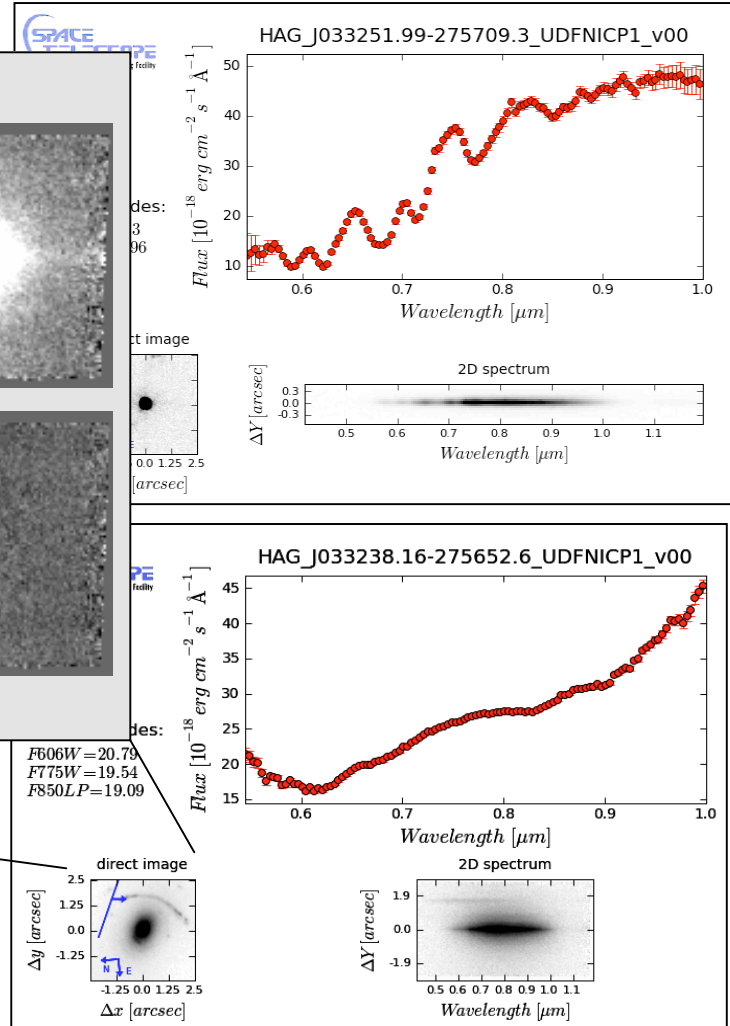- Deliverables: spectra, direct image stamps, 2D grism stamps, previews via HLA interface
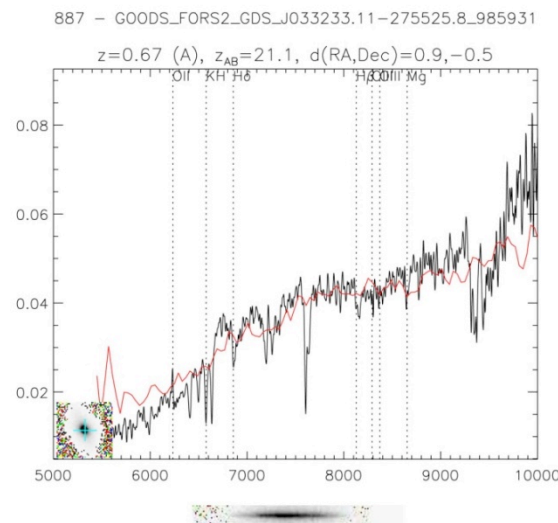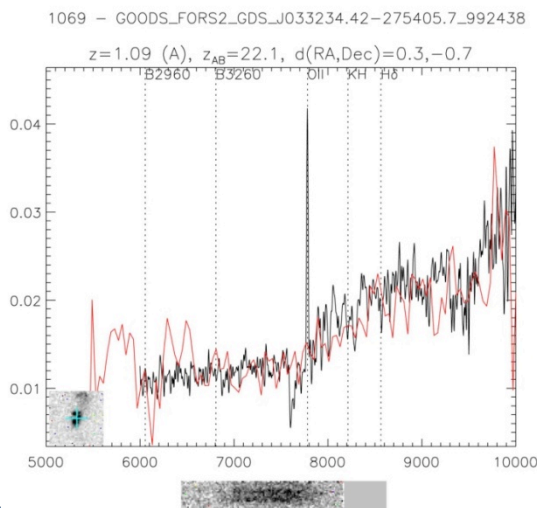
Examples previews

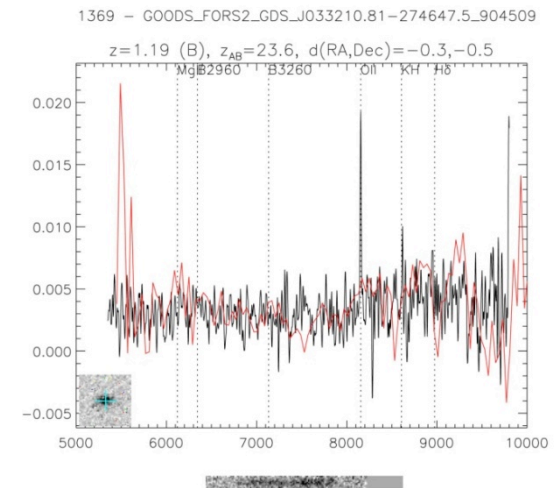**Low-redshift star-burst galaxy**

M-star

HAG_J033201.92-274959.9_UDFNICP2_v00

1.6"

W

N

HAG_J033251.99-275709.3_UDFNICP1_v00

des:
3
96

direct image

2D spectrum

HAG_J033238.16-275652.6_UDFNICP1_v00

F606W=21.02
F775W=20.68
F850LP=20.46

F606W=20.79
F775W=19.54
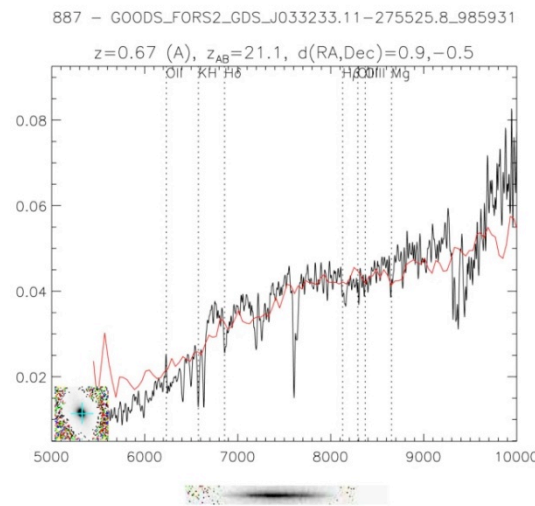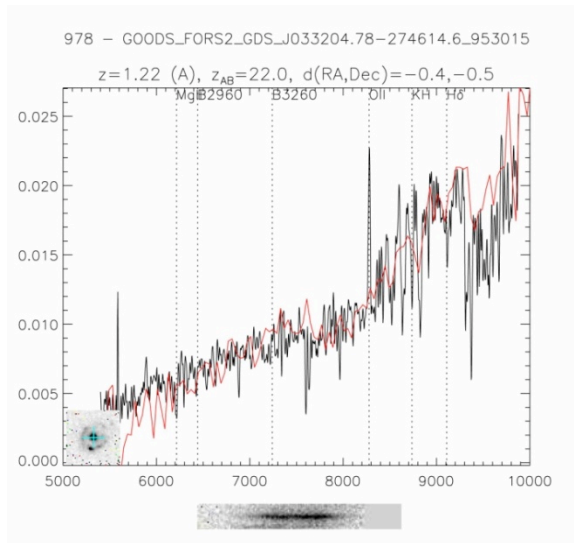F850LP=19.09

direct image

2D spectrum

direct image

2D spectrum

BAL QSO at z=2.81

Bright elliptical at z=0.62

Comparison to ESO/GOODS spectroscopy

- Thousands of VLT spectra in the GOODS-S region
- Useful to characterize limits and scientific niche of ACS grism spectroscopy (continuum to faint mags, high angular resolution spectroscopy)

WFC3 slitless spectroscopy

- Full support for WFC3 slitless modes – UVIS G280L and NIRS G102 and G141 grisms. Close involvement with WFC3 team

- SMOV validation of NIR grism properties and calibrations for Cy17 proposals (including G280L, SNAP proposal)

- NIR grisms – spectrum trace, wavelength calibration – close to TV3 values. Sensitivity ~10% increased over TV3

- Actively supporting users; using public data to check and derive super-background; working closely with WFC3 ERS team
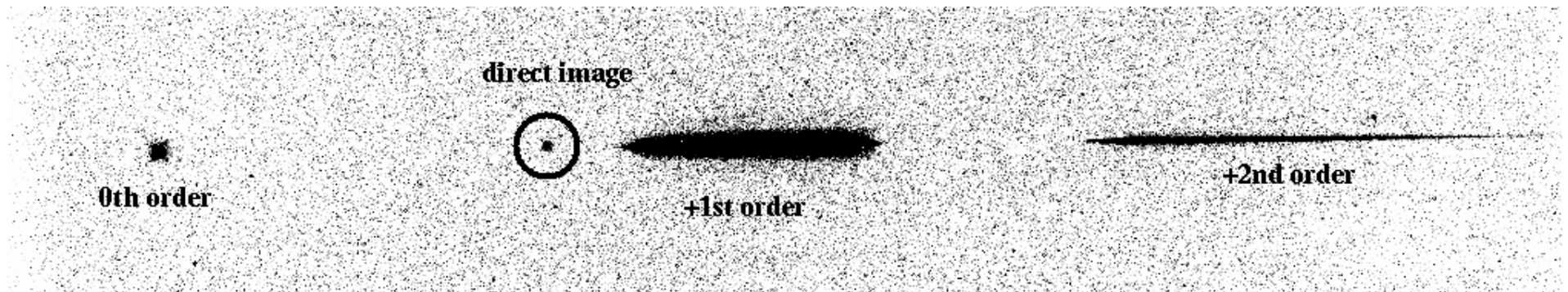
Throughput calibration

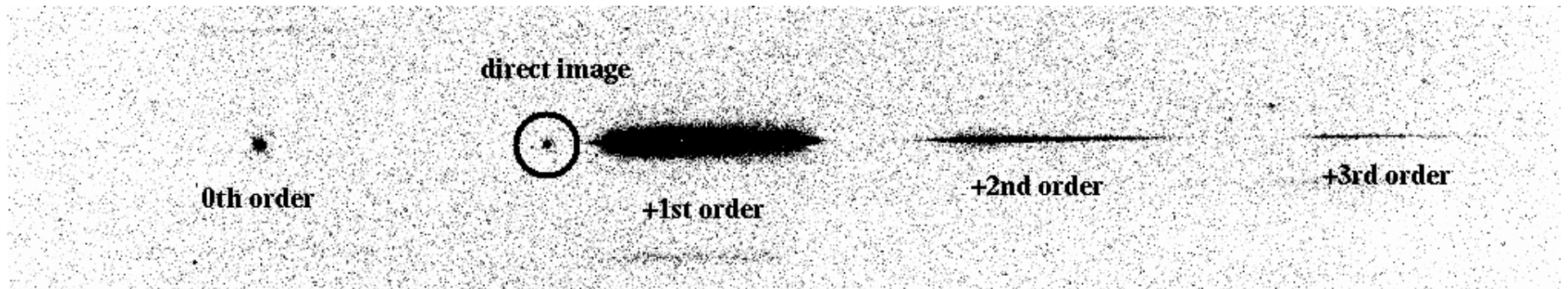WFC3 G102 grism - SMOV

WFC3 G141 grism - SMOV
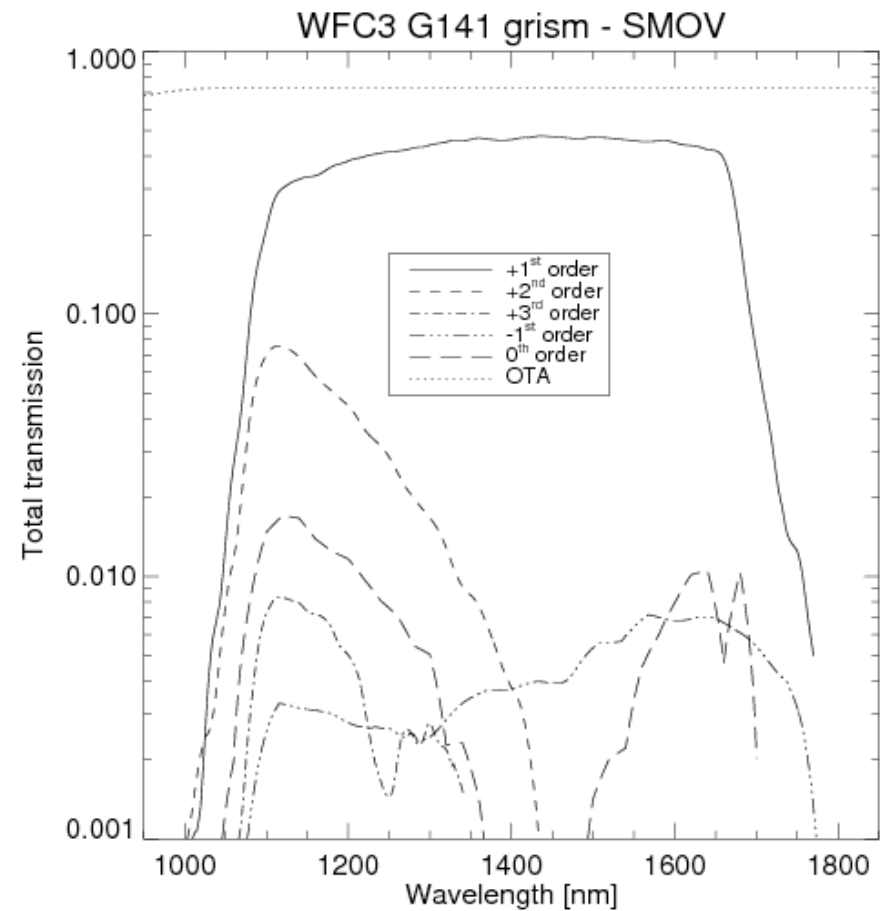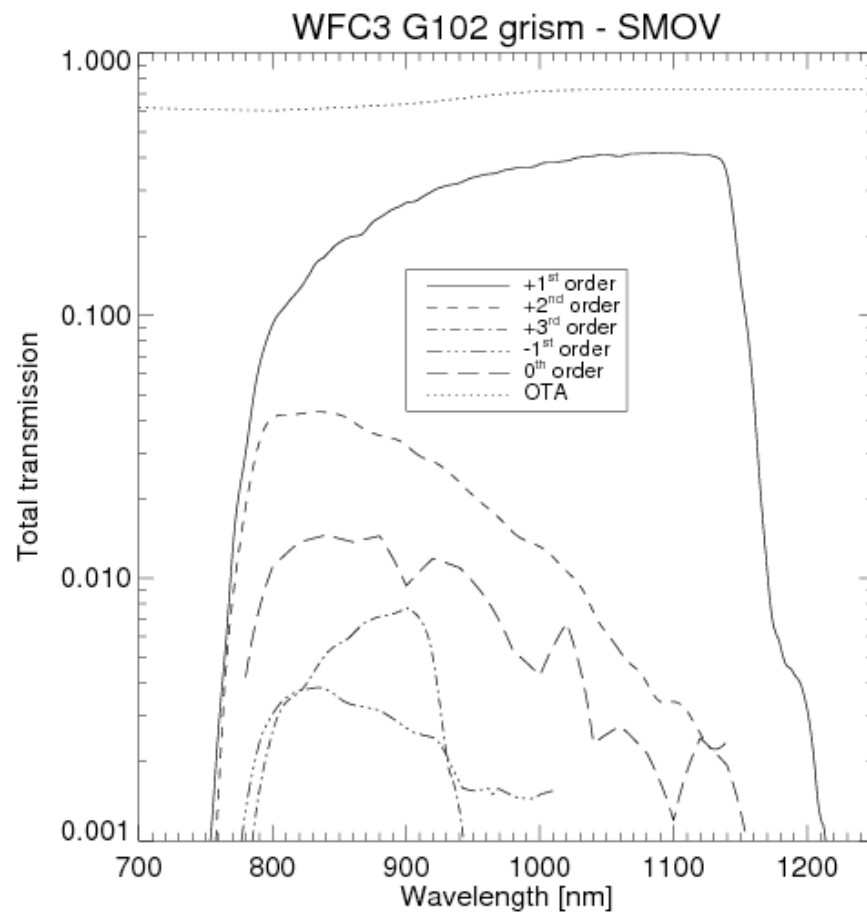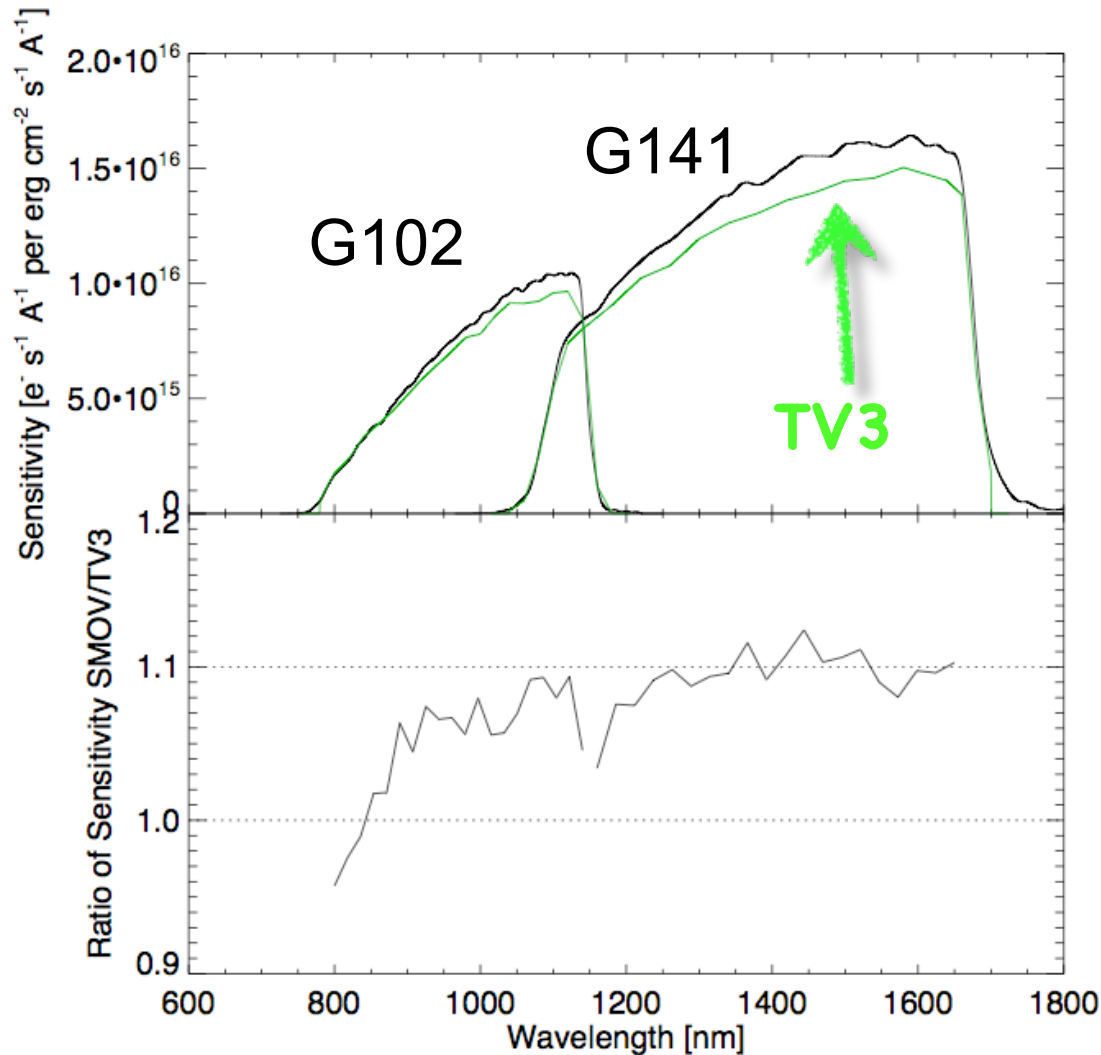
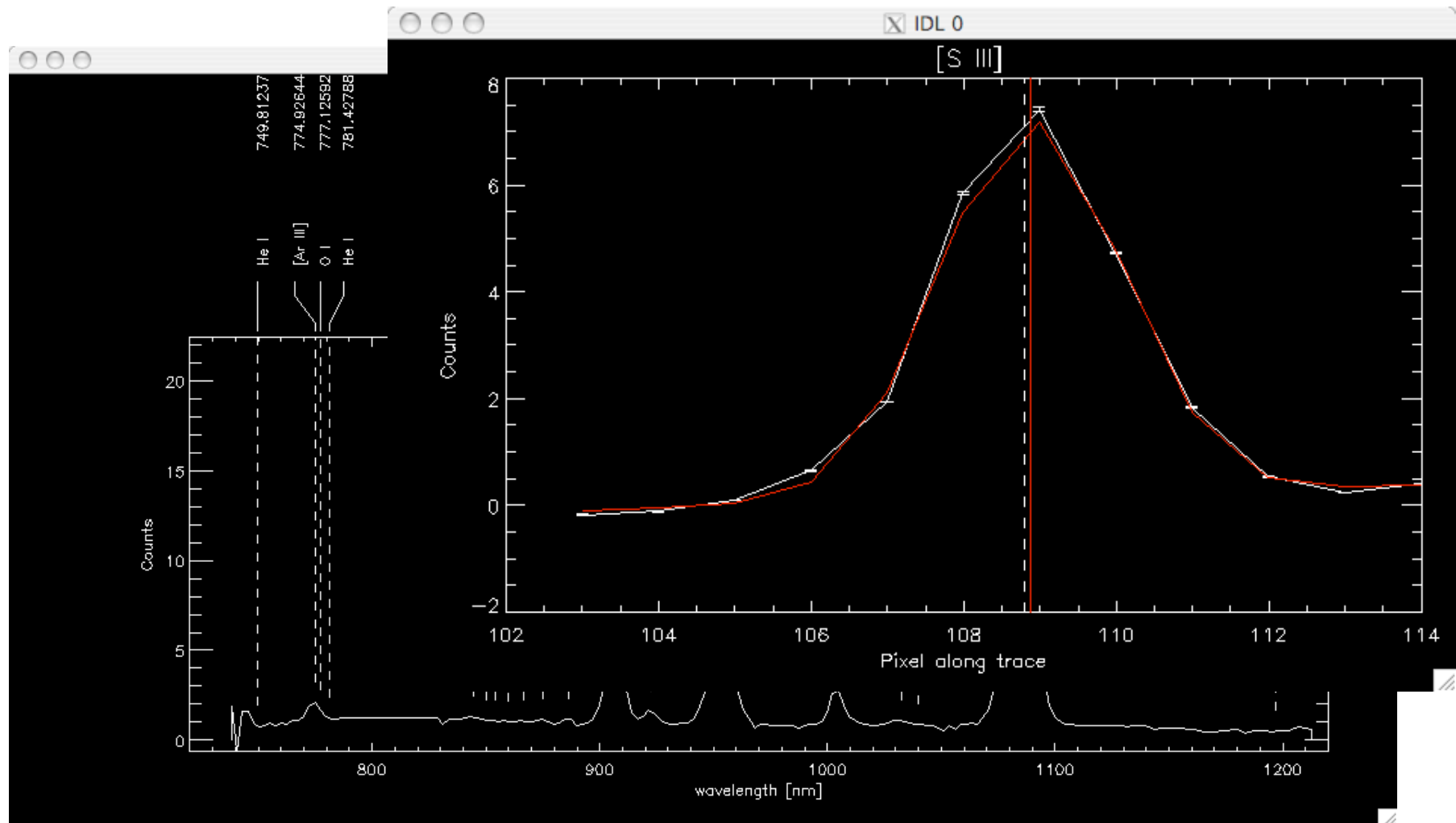# Flux std star GD153 SMOV data
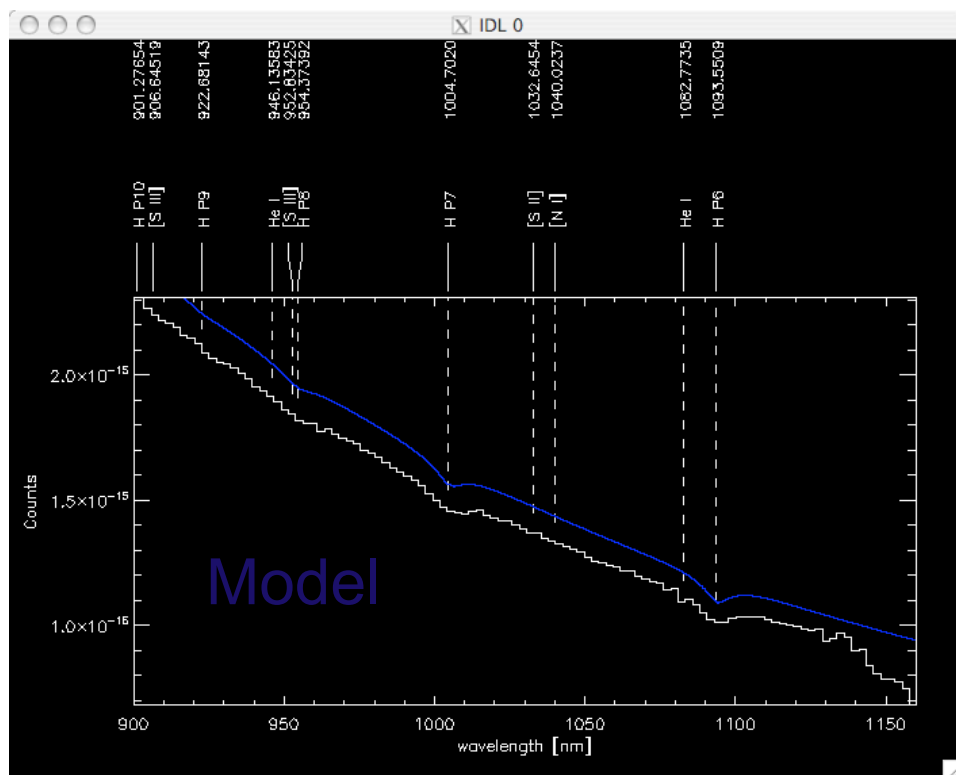
G102

G141

Throughput compared to TV3

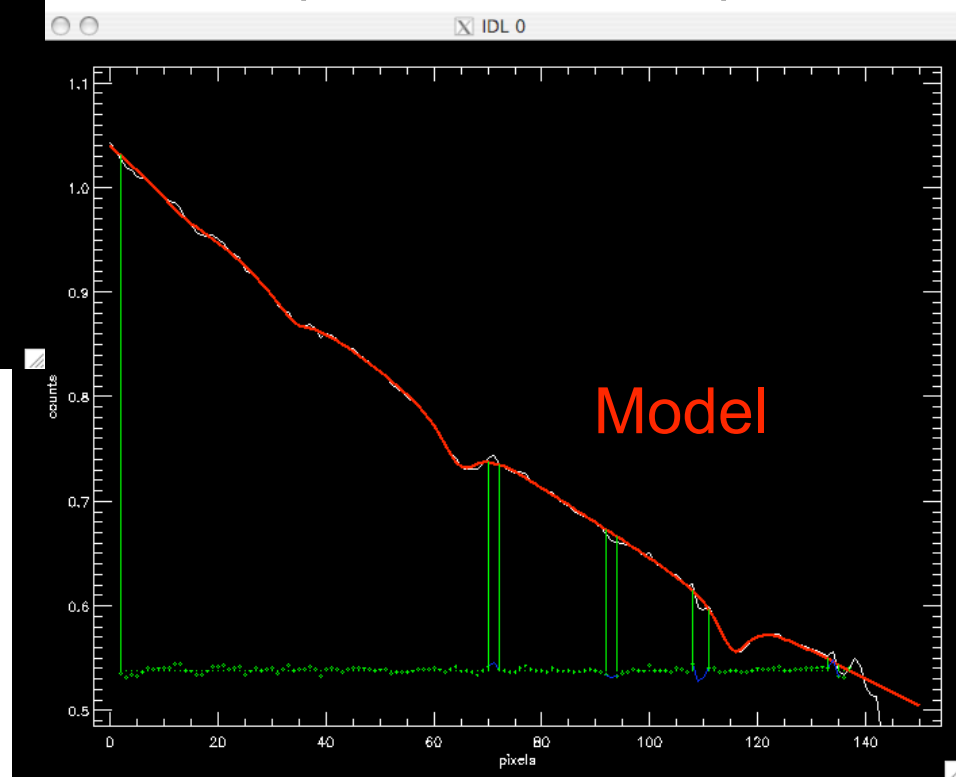5-10% more throughput!

Wavelength calibration

Checking wavelengths - G102

Direct pixel fit

V=-51±56 km/s

R=155±22
(nominal 210)

**Observed spectrum
(white)**

Example extraction ERS data

Emission line
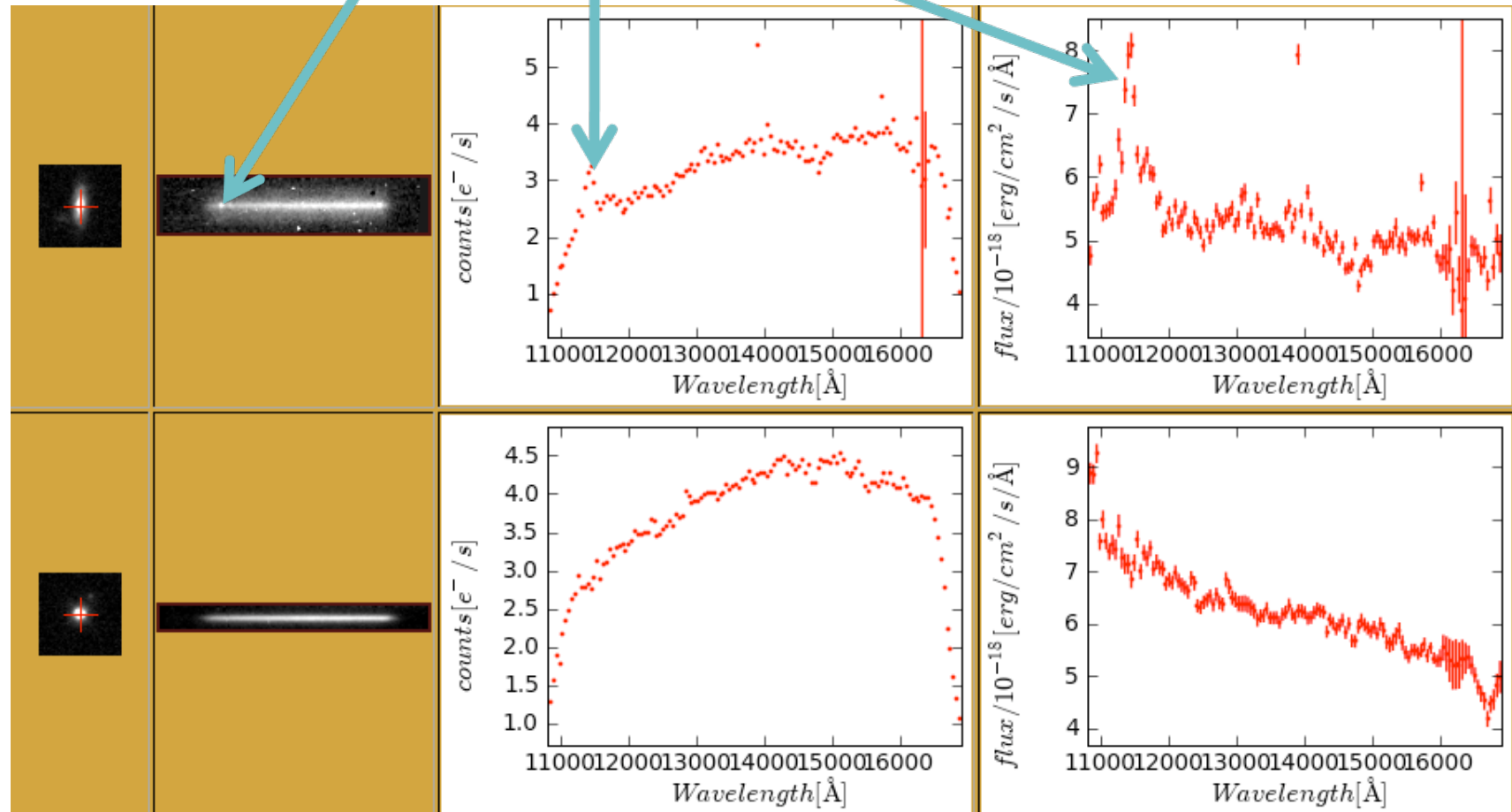
Slitless spectra extraction software

aXe-2.0

- Code cleaning to be better designed and maintainable aXe
- Extensively used, tested and refined on WFC3 in-flight data from various programs (ERS, ERO, calibration)
- Intregrated into STSDAS development code
- release: November '09 as part of STSDAS 3.11

aXeSIM

- Development of aXeSIM-1.3 (for STSDAS 3.11) with minor bug fixes
- Contains WFC3 parameters **on user request:** better control of default extraction

ST-ECF archive – HST Cache

- The HST Cache is an automatic system developed at ST-ECF and CADC to reprocess and recalibrate all HST datasets on a 24/7 basis using the latest software and reference files. The products are then stored on spinning disks for immediate download or delivery through VO protocols.

- First year of operations (63 years of cpu time, 50 TB uncompressed data)

- Inclusion of new HST instruments WFC3 and COS

- Cache seeds system (management of telemetry files and observation logs)
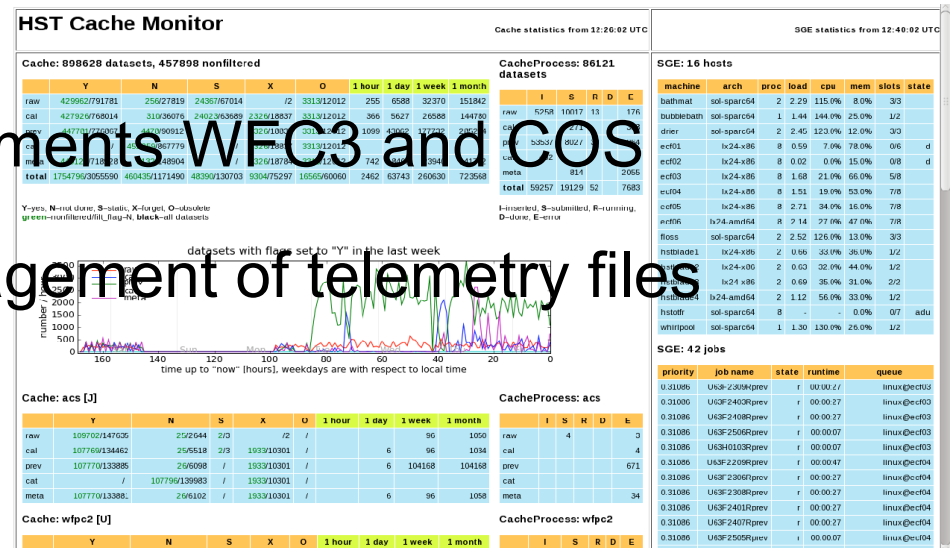
HST Cache – new features

- VO services: Simple Image Access (SIAP) and Simple Spectral Access (SSAP) for both classical HST and HLA archives. VOTables are shipped with footprints.

- Improved previews

- Inclusion of Hubble Legacy Archive Data (HLA)
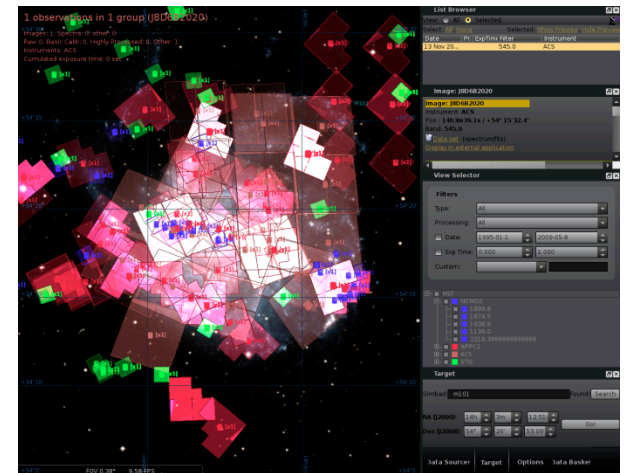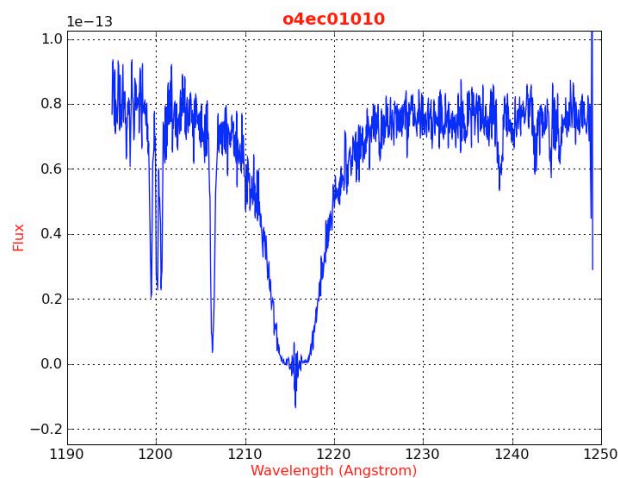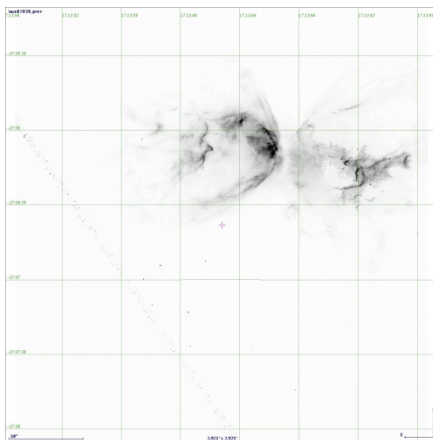
Archive interface

- New user interface: more concise, theme-grouped keywords, tooltip help, previews, programmatic access. Output formatting with code developed by Rick White and Tom McGlyn

- A one-line command interface with auto-completion is coming: understand simple queries such as "ACS F775W within 20 arcm from NGC 220" or complex ones involving keywords, operators, and parentheses.

HST Outreach

- Close ties with ESO outreach group, now called Education and Public Outreach Department (ePOD)

- Colleen Sharkey now head Hubble European Information Centre (since February 2009)

- 13 releases so far in 2009

SMOV 4 release of ACS colour image of Abell 370. ECF involvement in the processing (Heic0910)

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ST-ECF Handover / Legacy

- A review of the ECF archive was conducted in 2008 to assess viability of handover to ESO. Procedures and operations have been streamlined to this aim → HST cache

- Expectation that ESO will support HST archive beyond 2010

- WFC3 slitless activities will be handed over to the WFC3 team, nominally by 30 June 2010, with 6 months for interaction

- aXe extraction and simulation software will be handed on to SSB, again with a 6 month interaction period

- A proposal has been made to ESA to continue support for Hubble European outreach at ESO

Science with the Hubble Space Telescope - III

- Third in a series of broad HST conferences in Europe (1st in Sardinia in 1992 and 2nd in Paris in 1995)

- Organized by ST-ECF and STScI with support from NASA and ESA

- Hosted by the Instituto Veneto di Scienze, Lettere ed Arte, 11-14 October 2010 with up to 200 participants

Chairs: Fosbury and Nota

SOC:

Bertola, Longair, Renzini

Ford, Green, Leshin, O'Connell,

Barstow, Kennicutt, Leibundgut,

McCaughrean, Kennicutt, Östlin,

Reid, Tinetti, Tolstoy, Tosi