ST-ECF Activities

Jeremy Walsh
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
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- Unpublished grism data in a region with a very rich multi-λ data set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):
  \[ \text{UNFNICP1} = \text{J8MT20KDQ} + \text{J8MT21WIQ} \]
  \[ \text{UNFNICP2} = \text{J8MT43HEQ} + \text{J8MT44JBQ} \]
- Deliverables: spectra, direct image stamps, 2D grism stamps, previews via HLA interface
Examples previews

Low-redshift star-burst galaxy

M-star

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
Flux std star GD153 SMOV data
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)
- Integrated 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 McGlynn.

- A one-line command interface with auto-completion is coming: understand simple queries such as "ACS F775W within 20 arcmin 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)
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

STUC Meeting 12-13 Nov 2009