Cycle 13 Phase II Update for STIS

In this update...

This update provides the latest information regarding STIS performance, tools, documentation, and policies which are relevant to the preparation of Cycle 13 Phase II proposals. This information may also be found on the STIS web page at http://www.stsci.edu/hst/stis. As always, new information will be regularly described in the Spectrographs STAN (Space Telescope Analysis Newsletter) and posted on the web pages. General help or documentation may be obtained by sending email to *help@stsci.edu*.

This update should be used in conjunction with the STIS Instrument Handbook (IHB) version 7.0 and the Cycle 13 Phase II Proposal Instructions to aid you in the completion of your Phase II proposal for Cycle 13. If you have specific questions not covered in the documents, you should consult your Program Coordinator, Contact Scientist (if one has been assigned), or send email to *help@stsci.edu*.

New versions of STIS Exposure Time Calculators

As part of the Astronomer's Proposal Tool (APT) project, new Java-based versions of the exposure time calculators (ETCs) have been developed for all HST instruments. The switch to the APT ETCs was made in order to standardize the calculators for all the instruments, both to simplify development and support, and to provide a more consistent interface. Users will find that the new ETCs provide more realistic calculations and improved cross-instrument consistency.

The new STIS APT ETCs are available from our website at:
http://www.stsci.edu/hst/stis/software/etc

Differences and improvements with respect to CGI ETCs

Most results obtained from the latest versions of the APT ETCs should be close to those calculated by the older Common Gateway Interface (CGI) ETCs. There are, however, some notable differences and enhancements.

- The new sky background model of Giavalisco, Sahu, & Bohlin (2002), discussed in WFC3 ISR 2002-12, has been implemented for all HST instruments.

- More realistic curves of encircled energy as a function of wavelength have been adopted. This is especially important for the CCD at IR wavelengths, where in-chip scattering puts a large fraction of the detected light in an extended halo.

- Calculations for extended and emission-line sources are significantly more accurate, and relax a number of approximations made in older versions.

- The full complement of supported apertures for each configuration is now included.

- Imaging peakup calculations for point sources are now included in the Target Acquisition ETC.

- Bruzual synthetic spectra are offered in addition to Kurucz models as stellar templates.

- A selectable extraction radius for imaging of point sources has been implemented.

- Rectangular (in addition to square) CCD binning is now available.

- Additional background specification options are offered.

- Total counts are now given for resolution elements rather than lambda-pixels.

- The extended-source lambda-pixel is now 2 pixels high.

- Many additional parameters, particularly for backgrounds and noise, are listed in the APT output page. The time to saturation for CCD images is now also included.

Significant changes since the Phase I version of the APT Spectroscopic ETC

A preliminary version of the new Java-based APT ETCs had been made available for GO use during the Phase I of Cycle 13. However, a warning was also given indicating that this version had not been exhaustively tested. Indeed, subsequent testing did turn up a few issues with the Spectroscopic ETC which have since been corrected.

- ETC calculations for extended sources are now correct. Results with the earlier APT version may underestimate extended source count rates by as much as a factor of three when observations are done using narrow slits.

- An error in the reported count rates for G230LB and G230MB modes has been fixed. Note that this error did not affect the reported S/N ratio.

- The results for the full output table are now given per resolution element, rather than per lambda-pixel.

- The extraction box heights used for calculating dark and sky counts for point-sources have been changed back to the smaller values (3 or 5 pixels) that they had in the old CGI ETC. The earlier APT release had changed the extraction box sizes to the larger values used in the CALSTIS pipeline. However, when reducing observational data where the S/N is limited by the dark or sky counts, the user can easily exclude this extra background by recalibrating the data with a smaller-than-default extraction box. Adopting the smaller box sizes gives a more realistic estimate of the exposure time required to achieve a given S/N ratio in these cases. In the near future we plan to implement an option to allow the user to specify the extraction box size in the ETC.

Correcting ETC calculations for CTE effects

The IRAF script cteloss, available from http://www.stsci.edu/hst/stis/software/scripts/CTE_correction_descrip.html,

was previously provided to allow users to estimate the effects of charge transfer inefficiency (CTI) on their exposure times and can still be used with the new Spectroscopic APT ETC, although users should be aware that the net, sky, and dark columns in the ETC output have been reordered.

New aperture locations

We remind observers that a number of new aperture locations have been defined for STIS observations. These include the D1 aperture locations for minimizing the FUV MAMA dark current, the E2 aperture locations for better fringe-flat subtraction near row 900 of the CCD, and a new WEDGEA0.6 coronagraphic aperture location, which uses a narrower position on the wedge than did previously defined coronagraphic apertures. These new aperture locations are more fully described in Section 2.2 of the Cycle 13 STIS IHB.

Supported and Available ACQ/PEAK modes

In the past, ACQ/PEAK observations with the 52X0.2, 6X0.2, and 0.2X0.2 apertures were officially supported, although were rarely used. However, the use of the default peakup parameters in these 0.2" wide apertures does not significantly improve the centering, and in some cases may actually degrade it. Therefore peakups with the 52X0.2, 52X0.2E1, 6X0.2, and 0.2X0.2 apertures have been changed from being fully supported to "available-but-unsupported". If your program using an 0.2" wide aperture requires better centering than given by a regular ACQ observation, then the peakup should be done in a narrower aperture; e.g., peak up using the 52X0.1 slit before observing with the 52X0.2. Note, however, that most observations with 0.2" or wider apertures should not require peakups at all; the centering given by the ACQ observation itself will be sufficient for most purposes.

The 0.2X0.09 and 0.2X0.2 apertures are recommended for most E230H science observations, and peakups with the 0.2X0.09 aperture have always been fully supported. In special cases, observers may prefer to make E230H science observations with the 0.1X0.09 or 0.1X0.2 apertures, which are supported modes. However, these apertures are "available-but-unsupported" for ACQ/PEAK observations. The only 0.1" high aperture fully supported for peakups is the 0.1X0.03 aperture, which requires a complicated and time-consuming two-stage peak-up process, beginning with the 0.2X0.09 aperture. Alternatively, observers can use the 0.1X0.09 aperture for ACQ/PEAK observations by

requesting permission to use "available-but-unsupported" mode in their Phase II proposals.