Cycle 21 STIS Calibration Plan

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Cycle 21 Instrument Usage Statistics Based on Phase II Submissions

- STIS orbits comprise almost 16% of all prime orbits in Cycle 21

Instruments*	Prime Orbits Usage	SNAP Orbit Usage
ACS	9.17%	37.46%
COS	30.12%	4.68%
STIS	15.98%	21.45%
WFC3	44.70%	36.41%
FGS	0.03%	---

STIS Cycle 21 Exposure Time Percentages as a Function of Configuration/Mode

Configuration/Mode	Percentage of STIS Prime Exposure Time	Percentage of STIS SNAP Exposure Time
CCD	**20.27%**	**0.2%**
CCD/Imaging	4.33%	0.2%
CCD/Spectroscopy	15.94%	---
FUV	**38.49%**	**48.99%**
FUV/Imaging	2.96%	---
FUV/Spectroscopy	35.53%	48.99%
NUV	**41.24%**	**50.81%**
NUV/Imaging	0.06%	---
NUV/Spectroscopy	41.19%	50.81%

STIS Cycle 21 Exposure Time Percentages as a Function of Grating/Mirror

Configuration/Mode	Grating/Mirror	Percentage of STIS Prime Exposure Time	Percentage of STIS SNAP Exposure Time
STIS/CCD	G230LB	0.06%	---
	G230MB	0.12%	---
	G430L	7.85%	---
	G430M	0.37%	---
	G750L	6.57%	---
	G750M	0.97%	---
	MIRROR	4.33%	0.2%
STIS/FUV	E140H	12.36%	---
	E140M	17.82%	---
	G140L	5.27%	44.12%
	G140M	0.08%	4.87%
	MIRROR	2.96%	---
STIS/NUV	E230H	18.16%	32.42%
	E230M	10.53%	---
	G230L	12.49%	18.39%
	MIRROR	0.06%	---

STIS Cycle 21 Calibration and Monitor Orbits Request

Prop. ID	Title	External	External Parallel	Internal	Frequency	Cycle 20 Allocation
	CCD Monitors					
	STIS CCD Performance Monitor			14	2x7	14
	STIS CCD Dark Monitor			730	364+366	730
	STIS CCD Bias and Readnoise Monitor			369	182+183+4	369
	STIS CCD Hot Pixel Annealing			39*	13x3	39
	STIS CCD Spectroscopic Flat-Field Monitor			19	19x1	19
	STIS CCD Imaging Flat-Field Monitor			4	4x1	4
	STIS CCD Spectroscopic Dispersion Solution Monitor			3	3x1	3
	STIS CCD Sparse Field CTE			82	82x1	82
	STIS CCD Full Field Sensitivity	1			1x1	1
	STIS Slit Wheel Repeatability			1	1x1	1
	STIS CCD Spectroscopic Sensitivity Monitor	5			3x1/L, 1x2/M	5
	STIS CCD Saturation Limits			5	5x1	0
	MAMA Monitors					
	STIS MAMA Spectroscopic Dispersion Solution Monitor			7	7x1	7
	STIS MAMA Full Field Sensitivity	3			1x3	3
	STIS MAMA Spectroscopic Sensitivity and Focus Monitor/ COS Observations of Geocoronal Lyα Emission	12			3x1/L, 1x1/M, 4x2/E	12
	STIS FUV MAMA Dark Monitor			54	9x6	54
	STIS NUV MAMA Dark Monitor			52	26x2	52
	STIS MAMA NUV Flat-Field Monitor			11*	11x1	11
	STIS MAMA Fold Distribution			2	1x2	2
	STIS MAMA Anomalous Recovery			(6)		
Cycle 21 Total		21		1392 + (6)		1395 + (6)

* Internal parallel orbits > 1800s.

Green means "executing this cycle only"

() Indicates contingency orbits not included in Cycle 20 request.

STIS Calibration and Monitor Orbits Request by Cycle

	Programs	External Orbits	Parallel Orbits	Internal Orbits	Total Orbits
Cycle 17	25	68	0	1816	1884
Cycle 18	20	22	0	1370	1392
Cycle 19	18	21	0	1418	1439
Cycle 20	20	21	0	1391	1412
Cycle 21	20	21	0	1392	1413

External Orbit Requests has remained constant over the last 3 cycles.

STIS CCD Performance Monitor
P.I. Svea Hernandez

Purpose	To measure the baseline performance of the CCD system.
Description	This program monitors the performance of the CCD system on orbit during 2014. Only primary amplifier D is used. Bias and Flat Field exposures are taken in order to measure read noise, CTE (EPER test), spurious charge and gain. Full frame observations are made. Bias exposures are taken in sub-array readouts to check the bias level for ACQ and ACQ/PEAK observations. All orbits < 1800s.
Fraction GO/GTO Programs Supported	20% of STIS total exposure time.
Resources Required: Observations	14 internal orbits, performed in two groups of 7.
Resources Required: Analysis	2 FTE weeks for analysis. Provides baseline measurements of gains, read noise, charge transfer efficiency, spurious charge and performance verification of binning and sub-array readout capabilities. Provides a rough assessment of changes in flat field features due to dust motes or other particulates.
Products	Possible update of the gain and read out noise values in ccdtab. This also provides a relative measure of CTI via the extended pixel edge response test. Possible flight software updates of table CCDBiasSubtractionValue. Possible report in a STAN and a summary in the end of cycle ISR.
Accuracy Goals	Read-out noise error < 0.3 electrons. Gain error < 0.08 electrons./ADU
Scheduling & Special Requirements	Orbits will occur every 6 months starting in March 2014 and then in September 2014.
Changes from Cycle 20	No changes.

STIS CCD Dark Monitor (Parts 1 & 2)
P.I. Svea Hernandez

Purpose	Monitor the darks for the STIS CCD.
Description	Obtain darks at GAIN=1 in order to monitor CCD behavior and chart growth of hot and bad pixels. Check how well the anneals work for the CCD. All exposures are internals and fit in occultation orbits. In addition to routine monitoring, one month of 60s daily darks will be taken with AMP=A to conduct a measure of the absolute CTI as a function of the number of transfers in the STIS CCD using warm pixels and a direct comparison to typical AMP=D 60s darks. We will schedule this month during periods when the STIS CCD is not being heavily used, thus mitigating any potential impact to GOs. All orbits < 1800s.
Fraction GO/GTO Programs Supported	20% of STIS total exposure time.
Resources Required: Observations	364 (part1) + 366 (part2) internal orbits (twice per day)
Resources Required: Analysis	4 FTE weeks; Retrieve and construct superdarks. These superdarks are compared to previous superdarks and the image statistics are checked to see if there are any anomalous statistical deviations. Analysis of CTE data.
Products	Weekly CDBS reference files (superdarks) and a summary in the end of cycle ISR.
Accuracy Goals	Superdark rms < 0.012 e-/s. S/N > 1.0
Scheduling & Special Requirements	Two orbits per day.
Changes from Cycle 20	No changes (including the data taken to support the CTI analysis).

STIS CCD Bias and Read Out Noise Monitor (Parts 1 & 2)
P.I. Svea Hernandez

Purpose	Monitor the bias in the 1x1 bin settings at GAIN=1 and at GAIN=4, to build up high S/N superbiases and track the evolution of hot columns. Also acquire GAIN=1, 1x1 biases through AMPS A and C to use in combination with biases taken through AMP D for monitoring of the read noise.
Description	Take full frame bias exposures in the 1x1 bin settings at GAIN=1, and 1x1 at GAIN = 4. Take full frame biases through AMPS A and C. All exposures are internals and fit in occultation orbits. In addition to routine monitoring, during one month we will use 4 orbits of GAIN=1, AMP=A biases in support of absolute CTI measurements using hot pixels in darks. All orbits < 1800s.
Fraction GO/GTO Programs Supported	20% of STIS total exposure time.
Resources Required: Observations	182 (part1) + 183 (part2) internal orbits + 4 CTI internal orbits
Resources Required: Analysis	2 FTE weeks. Retrieve and construct superbiases. These superbiases are compared to previous superbiases and the image statistics are checked to see if there are any anomalous statistical deviations. Furthermore, acquisition of biases through AMPS A and C will allow the read noise monitor to be accomplished.
Products	Weekly CDBS reference files (superbiases) and a summary in the end of cycle ISR.
Accuracy Goals	Superbias rms < 0.95 e- at GAIN=1 1x1 and rms < 1.13 e- at GAIN=4 1x1. S/N > 1.
Scheduling & Special Requirements	One orbit per day for the routine monitor
Changes from Cycle 20	No changes (including the data taken to support the CTI analysis).

STIS CCD Hot Pixel Annealing
P.I. Svea Hernandez

Purpose	To anneal hot pixels. The effectiveness of the CCD hot pixel annealing is assessed by measuring the dark current behavior before and after annealing.
Description	The characteristics of the CCD will first be defined by a series of bias, dark and flat-field exposures taken before the anneal. The CCD thermoelectric cooler will be turned off to allow the CCD detector temperature to rise from ~ -80 C to +5 C. The CCD will be left in the uncooled state for approximately 12 hours. At the end of this period the thermoelectric cooler is turned back on and the CCD is cooled to its normal operating temperature. Since the CCD on Side-2 does not have thermistor, a 4 hour period, at a minimum, is necessary to ensure that the CCD is cool and stable. After the CCD has stabilized bias, dark and flat-field images will be repeated to check for changes in the CCD characteristics. The flat field exposures will permit evaluation of any window contamination acquired during the annealing period. All visits > 1800s. Pure parallel mode.
Fraction GO/GTO Programs Supported	20% of STIS total exposure time.
Resources Required: Observations	39 internal orbits and all orbits > 1800s.
Resources Required: Analysis	2 FTE weeks. By comparing the number of hot pixels before and after the anneal we see if the hot pixels decrease and estimate the number of hot pixels that persist after the process.
Products	Hot pixel growth rate, median dark count rate, and a summary in the end of cycle ISR.
Accuracy Goals	Measure the growth rate of hot pixels to within 1% if possible.
Scheduling & Special Requirements	Anneals will execute every 4th week using 3 orbits.
Changes from Cycle 20	No changes.

STIS CCD Spectroscopic Flat-Field Monitor
PI: Stephen Holland

Purpose	Obtain medium resolution grating flats to determine the pixel-to-pixel variation for spectroscopic observations and produce the Cycle 21 reference P-flat (M and L modes).
Description	We will use the tungsten lamp and the medium resolution grating G430M to determine the pixel-to-pixel variations of the STIS CCD in spectroscopic mode. The flat exposures will be taken with the 50CCD and 52x2 apertures at five offset positions to map, with a sufficient SNR, the entire sensitive area of the detector. The expected signal is $\geq$1.4e+6 ADU/pixel. The expected accuracy is $\leq$1.5%.
Fraction GO/GTO Programs Supported	20%
Resources Required: Observations	19 internal orbits
Resources Required: Analysis	2.5 FTE weeks
Products	Reference files and an ISR as applicable. Summary in end of cycle ISR
Accuracy Goals	$\leq$1.5%
Scheduling & Special Requirements	9 orbits for G430M with 50CCD spread across the cycle; 1 visit every ~40 days 10 orbits for G430M with 52x2
Changes from Cycle 20	None

STIS CCD Imaging Flat-Field Monitor
PI: Stephen Holland

Purpose	Collect high SNR white light imaging flats (aperture=50CCD) for monitoring purposes and to create a new reference p-flat for chronographic and imaging observations.
Description	Once every 3 months, obtain a series of imaging CCD flats using the MIRROR and the unfiltered 50CCD aperture. The 3 months cadence will allow us to keep monitoring possible (but unlikely) variations across the cycle; while the combined observations will allow us to obtain an average signal ~620000 ADU/pix (similarly to past cycles) and create a high accuracy (~1%) imaging p-flat. The remaining time in each orbit/visit will be used to monitor the stability of the CORON aperture due to the MSM limited reproducibility.
Fraction GO/GTO Programs Supported	20%
Resources Required: Observations	4 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	Reference p-flat, an ISR as relevant, summary in end of cycle ISR
Accuracy Goals	1%
Scheduling & Special Requirements	1 visit every 3 months
Changes from Cycle 20	None

STIS CCD Spectroscopic Dispersion Solution Monitor
P.I. Paule Sonnentrucker

Purpose	To monitor the wavelength and spatial distortion maps
Description	Internal wavecals will be obtained with all 6 gratings (G230LB, G230MB, G430L, G430M, G750L, G750M) supported for use with the CCD. All observations will be obtained with the 52x0.1 aperture, which maps to 2 pixels at the CCD. The HITM1 lamp will be used, rather than the LINE lamp. The HITM1 lamp has a more favorable spatial illumination pattern, dropping by only a factor of 3 at row 900, relative to the peak brightness at row 420. A comparison LINE lamp wavecal is however included with the G430L/4300 grating. All orbits < 1800s.
Fraction GO/GTO Programs Supported	20.3% of STIS total exposure time.
Resources Required: Observations	3 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	Update wavelength dispersion reference file as needed, ISR, and a summary in the end of cycle ISR.
Accuracy Goals	0.2 pixels; wavelength accuracy for row 900. Wavelength coefficients are tabulated every 32 rows in the CCD dispersion (_dsp) reference file. Exposure times in this program have typically been chosen to yield a S/N ratio of at least 10 per pixel in row 900 after combining 32 rows. This constraint must be satisfied in the left, middle, and right thirds of the image. Existing HITM1 wavecals were used to estimate exposure times assuming no significant degradation since Cycle 18.
Scheduling & Special Requirements	none
Changes from Cycle 20	No changes.

STIS CCD Sparse Field CTE
P.I. Svea Hernandez

Purpose	Acquire an accurate correction for parallel register CTE losses that can be used for direct analysis of science data with negligible background. Do measurements for both GAIN settings (1 and 4).
Description	The sparse field CTE will be measured via internal calibration lamp observations taken through narrow slits. The strategy of the test is as follows. Using the onboard tungsten lamp, narrow slit images are projected at different positions on the detector. At each position a series of exposures is taken alternating between the 'A' and 'C' amplifiers for readout. The further the charge needs to be shifted to be read out, the more charge it will lose. For the parallel CTE measurement, the test will use the the cross disperser slits: 0.05x31NDB and 0.05x31NDA. In order to test the effects of different bias voltages the whole series of exposures are executed once for GAIN=1, and once for GAIN=4; this process requires a total of 74 orbits which includes various sets of biases. For the CTE pixel based correction, the test requires 8 orbits for darks read out with amplifiers A and C. All orbits < 1800s.
Fraction GO/GTO Programs Supported	20% of STIS total exposure time.
Resources Required: Observations	82 internal orbits
Resources Required: Analysis	2 FTE weeks
Products	Determine slope for time dependent correction of CTE, possible update of ccdtab reference file, and summary in the end of cycle ISR.
Accuracy Goals	CTE correction coefficients will be determined to a relative accuracy of 1%.
Scheduling & Special Requirements	The whole set of calibration exposures is repeated for GAIN= 1 and GAIN= 4. The first set should execute in November 2013 and includes visits 01-32; these must be done consecutively. The second set should be scheduled for December 2013 and includes visits 33-82, consecutively as well.
Changes from Cycle 20	No changes

STIS CCD Full Field Sensitivity
P.I. Julia Roman-Duval

Purpose	To monitor CCD sensitivity over the whole field of view.
Description	Measure a photometric standard star field in Omega Cen in 50CCD annually to monitor CCD sensitivity over the whole field of view. Keep the spacecraft orientation within a suitable range (+/- 5 degrees) to keep the same stars in the same part of the CCD for every measurement. This test will give a direct transformation of the 50CCD magnitudes to the Johnson-Cousins system for red sources. These transformations should be accurate to 1%. The stability of these transformations will be measured to the sub-percent level. These observations also provide a check of the astrometric and PSF stability of the instrument over its full field of view. Although this test is done using CCD imaging mode, the confirmation of detector stability and uniformity provided by this monitor is important for spectroscopic observations as well. All orbits > 1800s.
Fraction GO/GTO Programs Supported	20% of STIS total exposure time.
Resources Required: Observations	1 external orbit
Resources Required: Analysis	1 FTE week
Products	Possible STAN, a summary in the end of cycle ISR.
Accuracy Goals	1%
Scheduling & Special Requirements	ORIENT 310.0D TO 310.0 D; BETWEEN 15-JAN-2014:00:00:00 AND 20-MAR-2014:00:00:00
Changes from Cycle 20	No changes.

STIS Slit Wheel Repeatability
P.I. Audrey DiFelice

Purpose	To test the repeatability of slit wheel motions.
Description	A sequence of lamp spectra taken using grating G230MB and the three smallest long slits 52X0.1, 52X0.2, and 52X0.05.
Fraction GO/GTO Programs Supported	93%
Resources Required: Observations	1 internal orbit (24 exposures, ~40 minutes total)
Resources Required: Analysis	2FTE days
Products	The average and maximum shifts observed in the dispersion and the spatial direction. Summary in end of cycle ISR
Accuracy Goals	Shifts should be smaller than 0.5 pixels.
Scheduling & Special Requirements	None.
Changes from Cycle 20	Update the valid observation window to 2013

STIS CCD Spectroscopic Sensitivity Monitor
P.I. Stephen Holland

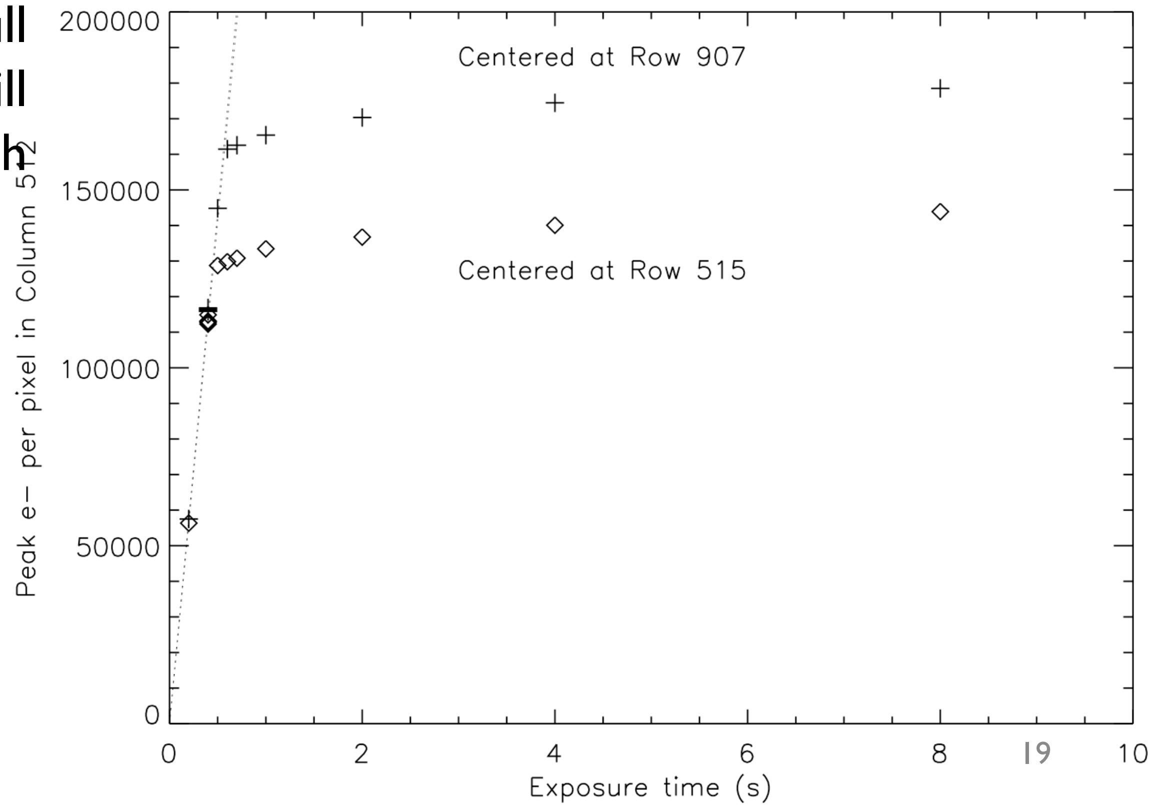
Purpose	Monitor the spectroscopic sensitivity of the STIS CCD using the low and medium resolution gratings to reveal contamination issues that may affect the spectroscopic throughput.
Description	This program will monitor the STIS CCD spectroscopic sensitivity using a high-declination spectroscopic calibration star. The results will be compared to previous observations to detect trends. The L modes will be observed at the nominal and E1 positions every four months with one orbit per visit. The M modes will be monitored once per year with two orbits per visit.
Fraction GO/GTO Programs Supported	20%
Resources Required: Observations	5 external orbits
Resources Required: Analysis	3 FTE weeks (1 week for analysis, 2 weeks for ISR)
Products	Updated STIS TDSTAB file, an ISR on STIS sensitivity monitoring, summary in end of cycle ISR
Accuracy Goals	Minimum signal to noise of 50 per resolution element at the least sensitive wavelength.
Scheduling & Special Requirements	Visits need to be approximately equally spaced throughout Cycle 21.
Changes from Cycle 20	None

STIS CCD Saturation Limits
P.I. Charles Proffitt

Purpose	Measure the level at which individual STIS CCD pixels stop responding linearly to added photons. Test will be done at both GAIN=1 and GAIN=4 at a variety of positions on the detector
Description	At each position and gain will take 6 tungsten CCD MIRROR exposures at levels ranging from 0.4X to 2X full well, using the 0.09X29 aperture. Will need non-standard MSM positions to cover the detector. We will interpolate response above and below linear level to find saturation limit
Fraction GO/GTO Programs Supported	About 20% of total STIS exposure time is done using the CCD.
Resources Required: Observations	5 internal orbits to do 10 positions on the detector at both gains. Using the 29" wide slit will require 2 non-standard MSM rotations to cover the full detector width at each Y row. Cover rows at 5 Y positions center (~row 512), +/- 200, +/-400.
Resources Required: Analysis	2 FTE weeks
Products	ISR and IHB updates, summary in end of cycle ISR
Accuracy Goals	Determine saturation limit as a function of position to 5% accuracy.
Scheduling & Special Requirements	Will require some simple special commanding to reach nonstandard MSM positions. While a few of these are already supported by the use of POS= optional parameters, additional positions beyond those already available in engineering mode will be required.
Changes from Cycle 20	This is a new special program. There are some similarities to visit 3 of program 13142

CCD full well levels

- Examination of data from 13142 shows that the documented STIS CCD GAIN=4 full well values of 144,000 e- and 120,000 e- near the center and edges of the detector are incorrect.
- Full well significantly deeper near top of detector: Individual pixels in middle column of detector saturate at ~130,000 e- in center vs ~ 160,000 e- at E1
- Determining saturation limit as a function of detector position is important for determining when serial transfer artifacts might contaminate saturated data
- Origin of current handbook full well values is obscure, so will redo measurements for both GAIN=1 and GAIN=4.



STIS MAMA Spectroscopic Dispersion Solution Monitor
P.I. Paule Sonnentrucker

Purpose	To monitor the wavelength dispersion solutions.
Description	Internal wavecals will be obtained in all gratings at primary and secondary central wavelengths chosen to cover Cycle 21 use. There is also overlap with choices of configurations used with previous calibration programs which will enable long-term monitoring. This program uses the LINE lamp for a total of approximately 8 hours, typically at a lamp current of 10 mA, consuming about 0.5% of the 15000 mA-hour lifetime. Extra-deep wavecals are included for some echelle modes and for some first order modes to ensure detection of weak lines. All orbits < 1800s.
Fraction GO/GTO Programs Supported	80% of STIS total exposure time.
Resources Required: Observations	7 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	Update reference file as needed and summary in the end of cycle ISR.
Accuracy Goals	0.1 pixels internal wavelength precision.
Scheduling & Special Requirements	none
Changes from Cycle 20	No changes

MAMA Full Field Sensitivity
P.I. Julia Roman-Duval

Purpose	To monitor the sensitivity of the FUV-MAMA and NUV-MAMA over the full field.
Description	By observing the globular cluster NGC6681 once every year at roughly the same orientation, we will monitor the full-field sensitivity of the MAMA detectors and their astrometric and PSF stability. These observations will be used to look for contamination, throughput changes, or formation of color centers in the photocathode and window that might be missed by spectroscopic monitoring or difficult to interpret in flat-fielding. Although this test is done using MAMA imaging modes, the confirmation of detector stability and uniformity provided by this monitor is important for spectroscopic observations as well. All orbits > 1800s.
Fraction GO/GTO Programs Supported	80% of STIS prime exposure time.
Resources Required: Observations	3 external orbits
Resources Required: Analysis	1 FTE week
Products	Possible STAN, a summary in the end of cycle ISR.
Accuracy Goals	Percent level; counting statistics signal-to-noise on bright stars
Scheduling & Special Requirements	Should roughly match most common orient from previous observations. ORIENT 260.0D TO 266.0 D; BEFORE 16-JUN-2014:00:00:00
Changes from Cycle 20	No changes.

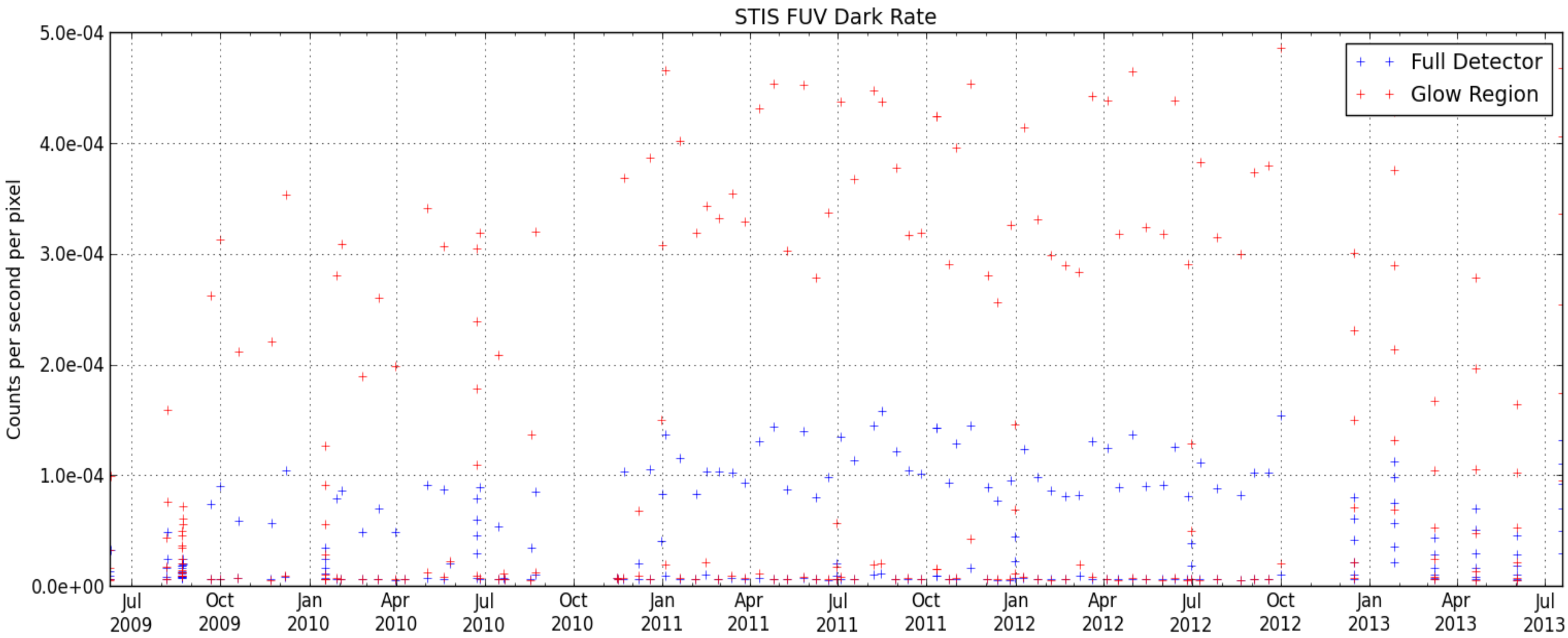
STIS MAMA Spectroscopic Sensitivity & Focus Monitor (& COS Observations of Geocoronal Lyman-α Emission)
PI: Stephen Holland

Purpose	Monitor the sensitivity of each STIS MAMA grating mode to detect any changes due to contamination or other effects, and monitor the STIS focus in spectroscopic and imaging modes
Description	Obtain exposures in each of the two low-resolution MAMA spectroscopic modes every 4 months, in each of the 2 medium-resolution modes once a year, and in each of the 4 echelle modes every 3 months, using unique calibration standards for each mode, and compare the results to the first observations to detect any trends. In addition, each L-mode sequence will be preceded by two spectroscopic ACQ/PEAKs with the CCD/G230LB and crossed linear patterns to measure the focus (PSF across the dispersion as a function of UV wavelength); Each M-mode sequence will be preceded by a CCD/F28X50OII direct image also to monitor the focus. (Whenever possible, COS/FUV airglow spectra will be obtained in parallell)
Fraction GO/GTO Programs Supported	80% of STIS prime exposure time
Resources Required: Observations	12 external orbits
Resources Required: Analysis	3 FTE weeks
Products	Updated STIS TDSTAB file and ISRs on STIS sensitivity monitoring and focus monitoring. Summary in end of cycle ISR
Accuracy Goals	Minimum signal to noise of 50 per resolution element at the least sensitive wavelength. 10% for focus changes.
Scheduling & Special Requirements	Visits need to be approximately equally spaced throughout Cycle 21.
Changes from Cycle 20	None

STIS FUV MAMA Dark Monitor
P.I. Colin Cox

Purpose	To monitor the dark rate in the STIS FUV detector to provide information for data analysis. Also to detect any large changes in instrument behavior which might indicate a problem.
Description	Six 1300 dark images are taken every six weeks. The exposures are distributed over about six hours from initial turn-on to characterize the rate increase as a function of turn-on time and temperature.
Fraction GO/GTO Programs Supported	40%
Resources Required: Observations	54 internal orbits
Resources Required: Analysis	0.05 FTE year
Products	Individual and cumulative dark images. Update dark rates in ETC and IHB. Text file giving full rate history plus graphical representation. All maintained on STIS monitor web page. Summary in end of cycle ISR
Accuracy Goals	Each measurement will give a statistical uncertainty of less than 1% for the global dark rate
Scheduling & Special Requirements	All measurements taken in SAA free periods in six sequential orbits. This matches time-on range of typical GO observations
Changes from Cycle 20	None

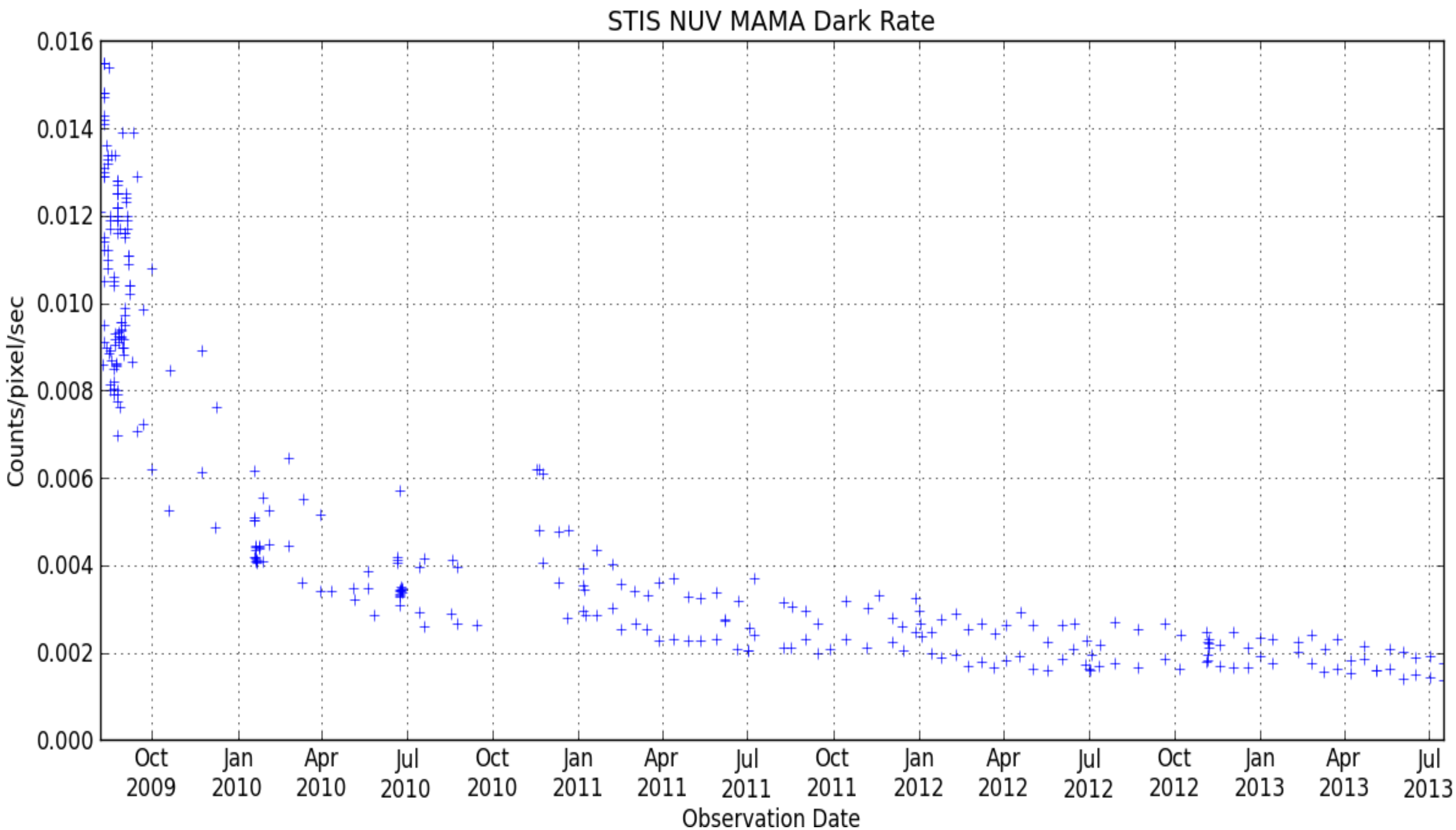
In ETC for C21: 1.5e-4 cts/pix/s



STIS NUV MAMA Dark Monitor
P.I. Colin Cox

Purpose	Monitor the dark rate in the STIS NUV MAMA to provide values for image processing and to detect any large changes which might indicate instrumental problems.
Description	Two 1300 second dark images are taken every two weeks. The images are taken about 6 hours apart to discriminate between long and short term changes.
Fraction GO/GTO Programs Supported	40%
Resources Required: Observations	52 orbits
Resources Required: Analysis	0.05 FTE year
Products	ETC and IHB dark rate updates. Individual and cumulative dark rates. Refinements to model describing temporal and temperature effects. Text file giving continuously updated dark rate history and graphical representation. Both maintained on STIS monitoring web page. Summary in end of cycle ISR
Accuracy Goals	Statistical accuracy of mean rate will be better than 1%.
Scheduling & Special Requirements	SAA free orbits covering a 6-hour period.
Changes from Cycle 20	None

In the C21 ETC: 0.0018 cts/pix/s



STIS NUV MAMA Flat-Field Monitor
PI: Stephen Holland

Purpose	This program is aimed at obtaining NUV-MAMA flat-field observations for the construction of pixel-to-pixel flats (p-flats) with a SNR of ~100 per binned pixel. The flats are obtained with the DEUTERIUM-lamp and the G230M grating. The actual choice of central wavelength and slit combination depends on the observed count level within each exposure.
Description	Past experience and observations have shown that ~11 visits are sufficient to build a p-flat with the required SNR~100/pix (2x2 "binning", low-res mode). However the actual instrument setup (central wavelength and slit width) and exposure time might change during the cycle in order to guarantee the needed count-level of ~250000-280000 cps/exposure. Past experience and observations have also shown that NUV-MAMA p-flats are mode independent, i.e. they do not depend on the wavelength. Therefore, a high-quality p-flat constructed with the G230M suffice all NUV-MAMA spectroscopic and imaging programs.
Fraction GO/GTO Programs Supported	40% of STIS prime time
Resources Required: Observations	11 internal orbits > 1800s
Resources Required: Analysis	4 FTE weeks
Products	Combine data from this and past cycles to produce new reference p-flat and an ISR, as applicable. Summary in end of cycle ISR
Accuracy Goals	1%
Scheduling & Special Requirements	1 visit per month
Changes from Cycle 20	None. This program is run on odd-numbered cycles.

STIS MAMA Fold Distribution
P.I. Thomas Wheeler

Purpose	The fold analysis provides a measurement of the distribution of charge cloud sizes incident upon the anode providing some measure of changes in the pulse-height distribution of the MCP and, therefore, MCP gain.
Description	While globally illuminating the detector with a flat field, the valid event (VE) rate counter is monitored, while various combinations of row and column folds are selected.
Fraction GO/GTO Programs Supported	40% of STIS prime orbits
Resources Required: Observations	2 internal orbits
Resources Required: Analysis	0.5 FTE day.
Products	The results will be sent to the COS/STIS Team and V. Argabright.
Accuracy Goals	
Scheduling & Special Requirements	This proposal is executed annually.
Changes from Cycle 20	None

STIS MAMA Recovery from Anomalous Shutdown
P.I. Thomas Wheeler

Purpose	Safe and orderly recovery of either MAMA detector from an anomalous shutdown.
Description	The recovery procedure consists of three separate tests (i.e. visits) to check the MAMA's health after an anomalous shutdown. Each must be successfully completed before proceeding onto the next. They are: (1) signal processing electronics check, (2) slow, intermediate voltage high-voltage ramp-up, and (3) ramp-up to full operating voltage.
Fraction GO/GTO Programs Supported	80% of STIS prime orbits
Resources Required: Observations	6 internal orbits
Resources Required: Analysis	If activated, 0.5 FTE day per test.
Products	For tests 1-3, only a Go/No-Go to proceed will be given.
Accuracy Goals	
Scheduling & Special Requirements	This is a contingency proposal activated only in the event of an anomalous shutdown. This proposal is usually followed by the STIS MAMA Fold Distribution proposal.
Changes from Cycle 20	None