Cycle 22 STIS Calibration Plan

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Cycle 22 Instrument Usage Statistics Based on Phase II Submissions*

- STIS orbits comprise almost 13% of all prime orbits in Cycle 22

Instruments	Prime Orbits Usage	SNAP Orbit Usage
ACS	17.4%	8.8%
COS	20.4%	9.8%
STIS	12.6%	68.3%
WFC3	49.7%	13.2%
FGS	0.0%	0.0%

* Include SNAP STIS program 13776 (450 orbits) for which Phase II still pending

STIS Cycle 22 Exposure Time Percentages as a Function of Configuration/Mode

Configuration/Mode	Percentage of STIS Prime Exposure Time		Percentage of STIS SNAP Exposure Time (0.9% of all STIS time)	
	C21	C22	C21	C22
CCD	**20.3%**	**26.4%**	**0.2%**	**100%**
CCD/Imaging	4.3%	8.5%	0.2%	--
CCD/Spectroscopy	15.9%	17.9%	---	100%
FUV	**38.5%**	**42.1%**	**49.0%**	**--**
FUV/Imaging	3.0%	1.5%	---	--
FUV/Spectroscopy	35.5%	40.6%	49.0%	--
NUV	**41.2%**	**31.5%**	**50.8%**	**--**
NUV/Imaging	0.06%	0.2%	---	--
NUV/Spectroscopy	41.2%	31.3%	50.8%	--

STIS Cycle 22 Exposure Time Percentages as a Function of Configuration/Mode

Configuration/Mode	Percentage of STIS Prime Exposure Time		Percentage of STIS SNAP Exposure Time (0.9% of all STIS time)	
	C21	C22	C21	C22
CCD	**20.3%**	**26.4%**	**0.2%**	**100%**
CCD/Imaging	4.3%	8.5%	0.2%	--
CCD/Spectroscopy	15.9%	17.9%	---	100%
FUV	**38.5%**	**42.1%**	**49.0%**	**--**
FUV/Imaging	3.0%	1.5%	---	--
FUV/Spectroscopy	35.5%	40.6%	49.0%	--
NUV	**41.2%**	**31.5%**	**50.8%**	**--**
NUV/Imaging	0.06%	0.2%	---	--
NUV/Spectroscopy	41.2%	31.3%	50.8%	--

STIS Cycle 22 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	
		C21	C22	C21	C22
STIS/CCD	G230LB	0.06%	3.4%	---	---
	G230MB	0.12%	0.03%	---	--
	G430L	7.9%	1.9%	---	52.1%
	G430M	0.4%	1.7%	---	--
	G750L	6.6%	9.4%	---	47.9%
	G750M	1.0%	1.5%	---	--
	MIRROR/CORON	4.3%	8.5%	0.2%	--
STIS/FUV	E140H	12.4%	4.2%	---	--
	E140M	17.8%	12.6%	---	--
	G140L	5.3%	17.4%	44.12%	--
	G140M	0.08%	6.4%	4.87%	--
	MIRROR	3.0%	1.5%	---	--
STIS/NUV	E230H	18.2%	0.7%	32.42%	--
	E230M	10.5%	13.1%	---	--
	G230L	12.5%	17.4%	18.39%	--
	MIRROR	0.06%	0.2%	---	--

STIS Cycle 22 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	
		C21	C22	C21	C22
STIS/CCD	G230LB	0.06%	3.4%	---	---
	G230MB	0.12%	0.03%	---	--
	G430L	7.9%	1.9%	---	52.1%
	G430M	0.4%	1.7%	---	--
	G750L	6.6%	9.4%	---	47.9%
	G750M	1.0%	1.5%	---	--
	MIRROR/CORON	4.3%	8.5%	0.2%	--
STIS/FUV	E140H	12.4%	4.2%	---	--
	E140M	17.8%	12.6%	---	--
	G140L	5.3%	17.4%	44.12%	--
	G140M	0.08%	6.4%	4.87%	--
	MIRROR	3.0%	1.5%	---	--
STIS/NUV	E230H	18.2%	0.7%	32.42%	--
	E230M	10.5%	13.1%	---	--
	G230L	12.5%	17.4%	18.39%	--
	MIRROR	0.06%	0.2%	---	--

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
Cycle 22	19	21	0	1387*	1408

External Orbit Requests have remained constant over the last 5 cycles.

* 5-orbit more in Cy 21 compared to Cy 22 due to execution of the special calibration program ("CCD Saturation Limits")

STIS Cycle 22 Calibration and Monitor Orbits Request

Prop. ID	Title	External	External Parallel	Internal	Frequency	Cycle 21 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
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 FUV Flat-Field Monitor			11*	11x1	11
	STIS MAMA Fold Distribution			2	1x2	2
Contingency program						
	STIS MAMA Anomalous Recovery			(6)		(6)
TOTAL	**Cycle 22 orbit request**	**21**		**1387 + (6)**		**1392 + (6)**

* Internal parallel orbits > 1800s.

Green means "executing on alternating cycle only"

() Indicates contingency orbits not included in Cycle 22 request.

STIS/CCD programs

STIS CCD Performance Monitor
P.I. Jo Taylor

Purpose	To measure the baseline performance of the CCD detector.
Description	This program monitors the performance of the CCD detector on orbit. 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	26% 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	Visits will occur every 6 months (March and September).
Changes from Cycle 21	No changes.

STIS CCD Dark Monitor (Parts 1 & 2)
P.I. Jo Taylor

Purpose	Monitor the darks for the STIS CCD.
Description	Routine monitoring: obtain 2 visit per day comprising of 1 long (1100s) and 2 short (60s) darks exposures 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	26% 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 21	No changes (including the data taken to support the CTI analysis).

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

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	26% 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 21	No changes (including the data taken to support the CTI analysis).

STIS CCD Hot Pixel Annealing
P.I. Jo Taylor

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	26% 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 21	No changes.

STIS CCD Spectroscopic Flat-Field Monitor
PI: Hugues Sana

Purpose	Obtain medium resolution grating flats to determine the pixel-to-pixel variation for spectroscopic observations and produce the 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 ≥1.4e+6 ADU/pixel. The expected accuracy is ≤1.5%.
Fraction GO/GTO Programs Supported	26%
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	≤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 21	None

STIS CCD Imaging Flat-Field Monitor
PI: Hugues Sana

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	26%
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 21	None

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

Purpose	To monitor the wavelength and spatial distortion maps for some configurations of the STIS/CCD.
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	26% 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	These observations are taken once per cycle
Changes from Cycle 21	No changes.

STIS CCD Sparse Field CTE
P.I. Sean Lockwood

Purpose	Re-establish 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 internal 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 amplifier A. All orbits < 1800s.
Fraction GO/GTO Programs Supported	26% of STIS total exposure time.
Resources Required: Observations	82 internal orbits
Resources Required: Analysis	3 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 duplicated for GAIN=1 and GAIN=4. The first set should execute in November 2014 and includes visits 01-32; these must be done consecutively. The second set should be scheduled for December 2014 and includes visits 33-64, consecutively as well. Visits 75-82 should be scheduled within the month-long annealing period that the STIS "CCD Dark Monitor 2" program AMP=A darks are taken ~(June 1, 2015 - June 22, 2015).
Changes from Cycle 21	Re-arranging visit to help with analysis (cosmic rays)

STIS CCD Full Field Sensitivity
P.I. Hugues Sana

Purpose	To monitor CCD sensitivity over the whole field of view.
Description	Observe 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	26% of STIS total exposure time.
Resources Required: Observations	1 external orbit
Resources Required: Analysis	1 FTE week
Products	Summary in the end of cycle ISR.
Accuracy Goals	1%
Scheduling & Special Requirements	ORIENT 310.0D TO 310.0 D; BETWEEN 15-JAN-2015:00:00:00 AND 20-MAR-2015:00:00:00
Changes from Cycle 21	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	90%
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 21	Update the valid observation window to 2014

STIS CCD Spectroscopic Sensitivity Monitor
P.I. Hugues Sana

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 (AGK+81D266). 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	26%
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 the cycle
Changes from Cycle 21	None

STIS/MAMA programs

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

Purpose	To monitor the wavelength dispersion solutions of some STIS MAMA configurations.
Description	Internal wavecals will be obtained in all gratings at primary and secondary central wavelengths chosen to cover cycle 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	74% of STIS total exposure time.
Resources Required: Observations	7 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	Update reference file as needed, ISR, and summary in the end of cycle ISR.
Accuracy Goals	0.1 pixels internal wavelength precision.
Scheduling & Special Requirements	These observations are taken once per cycle
Changes from Cycle 21	No changes

MAMA Full Field Sensitivity
P.I. Hugues Sana

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	74% of STIS prime exposure time.
Resources Required: Observations	3 external orbits
Resources Required: Analysis	1 FTE week
Products	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-2015:00:00:00
Changes from Cycle 21	No changes.

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

PI: Hugues Sana

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	- SENSITIVITY: 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 (L: GRW+70D5824, M: AGK+81D266, E: BD+28D4211), and compare the results to the first observations to detect any trends. - FOCUS: For this cycle we will enhance the monitoring of the STIS focus (PSF across the dispersion as a function of UV wavelength) by including a direct comparison between the G230LB 0.1X0.09 and 50CCD throughput as well as a narrow band OII CCD image during each L-Mode visit. These exposures can be added without requiring extra orbits if the G230L wavecal is shifted into the occultation. We will continue to also include an OII image with the M-mode visit. - AIRGLOW: Whenever possible, COS/FUV airglow spectra will be obtained in parallel (see COS slides)
Fraction GO/GTO Programs Supported	74% 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 the cycle.
Changes from Cycle 21	Enhanced focus monitoring strategy.

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, IHB and ETC updates. Also to detect any large changes in instrument behavior which might indicate a problem.
Description	Six 1300s 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	42%
Resources Required: Observations	54 internal orbits
Resources Required: Analysis	2.5 FTE week
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 21	None

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, to detect any large changes which might indicate instrumental problems and to update IHB and ETC.
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	31%
Resources Required: Observations	52 internal orbits
Resources Required: Analysis	0.05 FTE year
Products	ETC and IHB dark rate updates. Individual and cumulative dark rates. Master dark reference file. 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 21	None

STIS FUV MAMA Flat-Field Monitor
PI: Hugues Sana

Purpose	This program is aimed at obtaining FUV-MAMA flat-field observations to create new p-flats with a SNR of ~100 per (low resolution) pixel. The flats are obtained with the Krypton lamp and the MR grating G140M, similar to the cycle 17 and 18 programs. However the exact instrument setup (slit width and central wavelength) might change depending on the desired count level (which will be close to the internally allowed global rate limit).
Description	Past experience and observations have shown that ~11 visits are sufficient to create a cumulative image with ~2500 counts/pixel (high resolution mode, equivalent to ~10000 count/pixel in low resolution mode). We will start taking exposures with the setup G140M/52x0.1/1470 as in cycles 18 & 20 programs. We will move to G140M/52x0.1/1420 if/when the global rate has decreased below 180000-190000 counts/sec (maximum allowed is ~280000 counts/sec). On the basis of past experience exposures will be at least 4740 sec long. Hence, all orbits exceed the 1800 s execution time. Different visits will have different slit offsets in order to illuminate the pixels which are normally shadowed by the slit bars.
Fraction GO/GTO Programs Supported	42% of STIS total exposure time.
Resources Required: Observations	11 internal orbits and all orbits > 1800s.
Resources Required: Analysis	4 FTE weeks
Products	This cycle p-flat is for monitoring purposes. The achievable SNR is limited by the Poisson noise. If applicable a new reference p-flat will be created combining cycle 17, 18, 20 and 22 FUV flats. ISR as applicable.
Accuracy Goals	1.0%: Accuracy is per low-res pixel (2x2 high-res pixels).
Scheduling & Special Requirements	Similar to the NUV flat program, the observations are executed on alternate cycles, to save lamp lifetime.
Changes from Cycle 20	None. This program is run on even-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	74% 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 of Ball Aerospace.
Accuracy Goals	
Scheduling & Special Requirements	This proposal is executed annually.
Changes from Cycle 21	None

Contingency program

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	74% 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 21	None