STIS Cycle 17 Calibration Plan

ID	Proposal Title	Frequency	Time (orbits)		Scheduling Required CDBS	Resources Required (FTE weeks)	Products	Accuracy Required	Notes
			Ext	Int/P					
CCD Monitoring programs								
11843	CCD Performance Monitor	2/year		27	Mar 09 & Sep 09	3	CDBS, ISR, STAN	0.1ADU, drk 0.5 e-/hr, rms 0.05e-/hr/pix	Measures bias level, read noise, CTE and gain to check the performance and command readiness of CCD
11844 11845	CCD Dark Monitor	2/day		976	from 29 Nov 08 to Mar 2010	2	CDBS, ISR	>5%	Monitor CCD behaviour and chart growth of hot and bad pixels
11846 11847	CCD Bias Monitor	1/day		488	from 29 Nov 08 to Mar 2010	2	CDBS, ISR	0.1 ADU; rms 0.3-0.8 ADU	Track evolution of hot columns. Build high-S/N superbias
11848	CCD Read Noise Monitor	1/month, bi-monthly		20	monthly Jan-Apr then bimonthly	2	ISR	0.05 DN	For all amplifiers (A, B, C,D) full frame; Gain=1,4 binnings=1x1, 1x2, 2x1, 2x2
11849	CCD Hot Pixel Annealing	1/month		204P	28-day month, start in Dec 08	3	report; CDBS	detect hot pixels	Anneal hot pixels, track growth; examine CTE performance
11852	CCD Spectroscopic Flats	bi-weekly; monthly, 1/year		50	Start in Dec 08	3	CDBS; ISR	<5%	G430M biweekly first 4 months; then monthly. Others twice per year.
11853	CCD Imaging Flats	bi-monthly & 2/year		12	LP starts Dec 08	3	CDBS, ISR	<1%	Investigate flat-field stability. Clear and LP monthly, OII/OIII 2/year
11858	CCD Spectroscopic Dispersion solution	1/year		7	early in cycle	4	CDBS	0.2 pixel	Verify the dispersion coefficients. Do all cenwaves, subset are deep.
11850	CCD Sparse-field CTE internal	1/year		64	early in cycle, between Dec 08 and Feb 09	3	ISR; algorithm & coeff.	1.00%	Measures CTE using internal cal lamps and readouts.
11854	CCD full-field sensitivity monitor	1/year	1			2	ISR; STAN	1.00%	Monitor CCD sensitivity over whole field of view using standard star field.
11851	Slit wheel repeatability	1/year		1P	early in cycle	0.5	ISR	0.1 pixel	once per year

			Time (orbits)						
11855	CCD Spectroscopic Sensitivity monitor	L:6/yr M:3/yr	10		L modes monthly Dec-Feb	3	CDBS; ISR; report	2.00%	Detect any contamination and monitor throughput
MAMA monitoring programs									
11859	MAMA dispersion solutions	1/year		10 + 3P	early in cycle	4	CDBS, ISR	0.1 pixel	Annual monitor of dispersion solutions. Include deep echelle modes.
11856	MAMA full-field sensitivity	1/year	3			2	CDBS, ISR	1.00%	Star cluster in imaging mode. Monitor astrometric and PSF stability.
11860	MAMA spectroscopic sensitivity and focus monitor	E:2 M:1 L:6 P:2 /year	12		Start sequence in Dec 08, PRISM asap	4	CDBS, ISR, report	2% for sens., 10% for focus	Standard star spectra to monitor sensitivity. Focus monitor.
11857	MAMA dark monitor	2/week/detector		284	link pair of observations, start 8 Dec 08	3	CDBS, ISR	1.00%	Check health of MAMA detectors
11863	MAMA fold distribution	2/year		4		0.5	report, TIPS	95.00%	Measure performance of MAMA micro-channel plates : STIS ISR 98-02
11861	MAMA FUV flats	1/year		11	early in cycle, check lamp in Dec 08	4	CDBS, ISR	1.00%	Wavelength-independent pixel-to-pixel response stability.
11862	MAMA NUV flats	1/year		11	early in cycle, check lamp in Dec 08	4	CDBS, ISR	1.00%	Wavelength-independent pixel-to-pixel response stability:.
CCD Specials									
11652	Throughout Calibration of the 52X0.2E1 Aperture	once	1			0			GO calibration proposal of S. Heap.
MAMA Specials									
11865	COS flux standard	1/year	2		early in cycle	3	ISR	1-2%	L modes, FUV/NUV, LDS749B. Include CCD L modes and use for CTE check

			Time (orbits)						
11866	Echelle grating blaze function zero points	once	24		Early in cycle	4	CDBS, ISR	S/N 20-30 and 100	Flux standard G191B2B all echelle modes and deep common modes to establish new zero points
	Totals Cycle 17		**53**	**2172**		**59**			
	Cycle 12		35	1574		49			
	Cycle 11		70	1902		86			
	Cycle 10		108	1725		107			
	Cycle 9		84	1890		105			
	Cycle 8		135	1723		168			

TOTAL STIS GO ORBITS in CYCLE 17 :   411

CYCLE 12 :   892

CYCLE 11 : 1040

CYCLE 10 : 1809

CYCLE 9 : 1925

CYCLE 8 : 1919

Proposal ID 11843: CCD Performance Monitor

P.I. M. Wolfe

Purpose	Measure the baseline performance of the CCD system
Description	This activity measures the baseline performance and commandability of the CCD subsystem. Only primary amplifier D is used. Bias and Flat Field exposures are taken in order to measure bias level, read noise, CTE, and gain. Numerous bias frames are taken to permit construction of "superbias" frames in which the effects of read noise have been rendered negligible. Full frame and binned observations are made, with binning factors of 2x1, 1x2, 2x2. Bias frames are taken in subarray readouts to check the bias level for ACQ and ACQ/PEAK observations. All exposures are internals.
Fraction GO/GTO Programs Supported	60%
Resources Required: Observation	27 internal orbits
Resources Required: Analysis	3 FTE weeks
Products	Possible updates of the following CDBS files: Superbias frames and Superdark frames. Possible update of the gain, bias level, and read noise values in ccdtab. Possible flight software updates of table CCDBiasSubtractionValue. Possible reports in STAN and ISR.
Accuracy Goals	Bias level: better than 0.1 ADU at any position within CCD frame; read-out noise negligible.
	Dark current: good to 0.5 electron/hour. RMS noise level about 0.05 electron per hour per pixel. Systematic error in hot pixels may well exceed this limit.
Scheduling & Special Requirements	Sept 2009. Second set in Mar 2010. Third one in Sep 2010.

Notes: As CCD gets older using on-board binning option makes less sense, 2x2 darks dropped.

Proposal ID 11844 & 11845: CCD Dark Monitor

P.I. M. Wolfe

Purpose	Monitor the darks for the STIS CCD.
Description	Obtain darks at GAIN=1 in order to monitor CCD behaviour 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.
Fraction GO/GTO Programs Supported	60%
Resources Required: Observation	976 internal orbits
Resources Required: Analysis	2 FTE weeks
Products	Weekly CDBS reference files (superdarks)
Accuracy Goals	>5%
Scheduling & Special Requirements	Should start on 06 Jul 2009 and continue seamlessly into C18. Split into two proposals to facilitate scheduling.

Notes: Routine monitoring task remains unchanged. Model on 9605 & 9606. Need to restart and complete the bias-dark pipeline used to construct reference files. Internal orbits at 2 per day for all 365 days = 730. Plus Dec 08 = 796. To Mar 2010 = 976.

Proposal ID 11846 & 11847: CCD Bias Monitor

P.I. M. Wolfe

Purpose	Monitor the bias in the 1x1, 1x2, 2x1, and 2x2 bin settings at gain=1, and 1x1 at gain = 4, to build up high-S/N superbiases and track the evolution of hot columns.
Description	Take full-frame bias exposures in the 1x1, 1x2, 2x1, and 2x2 bin settings at gain=1, and 1x1 at gain = 4. All exposures are internals and fit in occultation orbits.
Fraction GO/GTO Programs Supported	60%
Resources Required: Observation	488 internal orbits
Resources Required: Analysis	2 FTE weeks
Products	Weekly and biweekly CDBS Superbias reference files
Accuracy Goals	Bias level: better than 0.1 ADU at any position within CCD frame
	superbias rms: 0.4 ADU at gain 1 1x1
	0.8 ADU at gain 1 1x2, 2x1, 2x2
	0.3 ADU at gain 4 1x1
Scheduling & Special Requirements	Should start on 06 Jul 2009 and continue seamlessly into C18. Split into two proposals to facilitate scheduling.

Notes: Unmodified and modeled on 9607 & 9608. Need to restart and complete the bias-dark pipeline used to construct reference files. Internal orbits at 1 per day for all 365 days, plus Dec 08 and Jan-Mar 2010.

Proposal ID 11848: CCD Read Noise Monitor

P.I. M. Wolfe

Purpose	Monitor the read noise in all of the on-chip amplifiers (A,B,C,D) to track changes affecting the STIS CCD.
Description	This proposal measures the read noise of the STIS CCD using pairs of bias frames. All amplifiers (A, B, C, D) are used. Full frame and binned observations are made in both Gain 1 and Gain 4, with binning factors of 1x1, 1x2, 2x1 and 2x2. All exposures are internals.
Fraction GO/GTO Programs Supported	60%
Resources Required: Observation	20 internal orbits
Resources Required: Analysis	2 FTE weeks
Products	ISR, updates to calibration reference files.
Accuracy Goals	0.05DN
Scheduling & Special Requirements	Monthly starting Aug 2009 until Jan 2010. Thereafter bimonthly starting Mar 2010 to Sept 2010.

Notes: In C12 the the frequency was reduced to bimonthly, orbits reduced from 22/26 (C10/C11) to 12. For C17 adopt monthly checks for first 4 months, thereafter bimonthly checks. If problems are apparent in first 4 months keep to monthly checks (update resources).

Proposal ID 11849: CCD Hot Pixel Annealing

P.I. M. Wolfe

Purpose	The effectiveness of the CCD hot pixel annealing process is assessed by measuring the dark current behavior before and after annealing and by searching for any window contamination effects. In addition CTE performance is examined by looking for traps in a low signal level spectroscopic flat. Follows on from proposals 8081/8410/8841/8906/9612/10022 and SMOV4 11399
Description	The chacteristics of the CCD will first be defined by a series of Bias, Dark and flat-field exposures. The CCD Thermoelectric cooler (TEC) will then be turned off to allow the CCD detector temperature to rise (from about -80C to +5C). The CCD will be left in the uncooled state for approximately 12 hours. At the end of this period, the TEC will be turned back on and the CCD cooled down to its normal operating temperature. Bias, Dark and flat-field images will be repeated to check for changes in the CCD characteristics. Because the CCD window is on the CCD housing and not bonded to the chip, the window is actually warmest when the CCD is being cooled (because the TEC power warms the housing and coldest during the TEC-off annealing process). The flat field exposures will permit evaluation of any window contamination acquired during the annealing period. Should continue on from the monthly scheduling of C12 program 10022 or SMOV program 11399.
Fraction GO/GTO Programs Supported	60%
Resources Required: Observation	204 Parallel orbits
Resources Required: Analysis	3
Products	Reference files, (flats, darks and biases) updates to hot pixel tables, reports and postings to the web.
Accuracy Goals	We want to anneal the CCD and measure the growth rate of hot pixels.
Scheduling & Special Requirements	Execute every 4th week. These are effectively external parallels since this activity precludes the use of STIS but allows the use of other instruments. Start week of 13-19 Jul 2009.

Notes: Unmodified proposal. Continue SMOV4 proposal 11399. New scripts from Mike Wolfe.

Proposal ID 11852: Spectroscopic Flats

P.I. C. Proffitt

Purpose Obtain CCD flats on the STIS CCD in spectroscopic mode.

Description 1). Take slitless flats for G430M, 5216 A every two weeks for first 4 months to construct early pflat with Gain=1 and 4. Use Tungsten lamps. Thereafter every month.

2). Monitor G430L, 4300A with 52X2 slit once yearly, GAIN=4, dither. Tungsten lamp.

3). Monitor G430M, 5216 A with 52X2 slit once yearly, GAIN=4, dither. Tungsten lamp.

Fraction GO/GTO Programs Supported 60%

Resources Required: Observation 50 internal orbits

Resources Required: Analysis 3 FTE weeks

Products Reference files and an ISR

Accuracy Goals <5%

Scheduling & Special Requirements Slit-less flats every 2 weeks for first four months, every month thereafter. 52X2 L/M flats during Jul 2009/Aug 2009, and later in C17

Notes: Assumes flats wavelength independent (as in STIS ISR 99-06). If Tungsten lamp is fainter than anticipated then resources may need to be revised and/or exposure times modified. We need the flats early in C17. Modify MAMA pflat routines for CCDs (STIS ISR 2002-03).

Proposal ID 11853: CCD Imaging Flats

P.I. C. Proffitt

Purpose	Investigate flat-field stability.
Description	Obtain a series of CCD direct and F28X50LP flats every 2nd month to monitor the characteristics of the CCD response. Also look for the development of new cosmetic defects. Spot check flats for F28XOII and F28XOIII twice per year.
Fraction GO/GTO Programs Supported	1%
Resources Required: Observation	12 internal orbits
Resources Required: Analysis	3 FTE weeks
Products	PFL reference files and an ISR
Accuracy Goals	0.5% pixel-to-pixel (except 0.8% for OII)
Scheduling & Special Requirements	50CCD & F28X50LP every two months starting Aug 2009 (together in one orbit). F28XOII and F28XOIII every 6 months; Apr and Oct 2010 (one orbit each time).

Notes: Only one proposal uses CCD imaging in C17 for science, this is direct imaging.

Proposal ID 11858: CCD Spectroscopic Dispersion Solution

P.I. D. Lennon

Purpose	Obtain wavecals deep enough to constrain wavelength and spatial distortion maps without overusing the calibration lamp
Description	Internal wavecals will be obtained with all 6 gratings (G230LB, G230MB, G430L, G430M, G750L, G750M) supported for use with the CCD. Data will be obtained for 38 central wavelengths. All observations will be obtained with the 52x0.1 aperture, which maps to 2 pixels at the CCD.

As of in Cycle 11, the HITM1 lamp is 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. In contrast, LINE lamp brightness drops by a factor of 25 at row 900, relative to a peak brightness at row 350. Adequate illumination at row 900 is required to support use of "E1" pseudo-apertures, which place spectra at row 900 to reduce the impact of charge transfer losses during parallel transfers to the CCD readout amplifier at the top of the image.

Beginning in Cycle 11, modes with weak lines will be observed with GAIN=1 to minimize the impact of read noise. Modes that require high dynamic range (G230LB, G430L, G750L, and some settings of G750M) will still be observed with GAIN=4.

This program uses the HITM1 lamp for a total of 0.6 hours at a lamp current of 10 mA, consuming about 0.05% of the nominal 15000 mA-hour lamp lifetime.

For Cycle 17 we include a comparison LINE lamp wavecal with the G430L/4300.

Fraction GO/GTO Programs Supported	60%
Resources Required: Observation	7 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	CCD dispersion reference file, ISR
Accuracy Goals	0.2 pixels for row 900
Scheduling & Special Requirements	Early in C17

Notes: In Cycle 17 we want a general health check for all gratings and commonly used cenwaves, a small subset of cenwaves (1or 2) per grating being deep exposures with the rest being shallow. For continuity with previous calibration programs we use the same cenwave positions for the deep wavecals as previously selected, even though some of these are not used in Cycle 17 GO/GTO programs.

Proposal ID 11850: CCD Sparse-field CTE Internal

P.I. M. Wolfe

Purpose	Re-sstablish 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 internal lamp observations taken through narrow slits. The strategy of the test is as follows. If there is a CTE effect, charge will be left behind as the image is shifted through pixels during readout. The further the charge needs to be shifted to be read out, the more charge it will lose. Because the D amp and the B amp read out at opposite ends of the CCD, the ratio in image intensity (B amp/D amp) should increase as the image position moves closer to the B-amp end (and further from the D-amp end).
	For the parallel CTE measurement, the test will use the the cross-disperser slits: 0.05X29, 0.05x31NDB, and 0.05x31NDA slits, projected on different parts of the detector via special commanding of the slit wheel. The whole series of exposures are executed once for GAIN=1, and once for GAIN=4 to test the effect of different bias voltages.
Fraction GO/GTO Programs Supported	60%
Resources Required: Observation	64 internal orbits
Resources Required: Analysis	3 FTE weeks
Products	ISR, algorithm for calibration and coefficients.
Accuracy Goals	CTE correction coefficients will be determined to a relative accuracy of 1%; photometry should not be limited to by >1% accuracy after correction for CTE.
Scheduling & Special Requirements	Early in Cycle 17 between Aug 09 and Sep 09.

Notes: Do a full iteration (GAINs 1 and 4) of this check once early in C17. Defer decision on a repeat until a supplemental calibration plan.

Proposal ID 11854: CCD Full-field Sensitivity Monitor

P.I. C. Proffitt

Purpose	Monitor CCD sensitivity over the whole field of view.
Description	Measure a photometric standard star field in Omega Cen in 50CCD mode every 6 months 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.
Fraction GO/GTO Programs Supported	1%
Resources Required: Observation	1 external orbits
Resources Required: Analysis	2 FTE weeks
Products	ISR, STAN
Accuracy Goals	1%
Scheduling & Special Requirements	Do this once in C17

Notes: Frequency twice per year since we drop the external sparse field monitor.

Proposal ID 11851: Slit Wheel Repeatability

P.I. M. Wolfe

Purpose	To check the stability of the STIS slit wheel by taking a sequence of comparison lamp spectra with grating G230MB/2697 and 3 different slits.
Description	Verify the repeatability of the slit wheel for 3 STIS slits (52X0.2, 52X0.1, and 52X0.05) by taking images with the LINE lamp. Use the G230MB/2697 and rotate the slit wheel among the 3 chosen slits.
Fraction GO/GTO Programs Supported	70%
Resources Required: Observation	1 parallel orbit
Resources Required: Analysis	2 FTE days
Products	ISR
Accuracy Goals	0.1 pixels
Scheduling & Special Requirements	Early in C17

Notes: Unmodified from previous cycles (see for example 10029).

Proposal ID 11855: CCD Spectroscopic Sensitivity Monitor

P.I. C. Proffitt

Purpose   Monitor sensitivity of each CCD grating mode to detect any change due to contamination or other causes.

Description   Obtain exposures in each of the 3 low-resolution CCD spectroscopic modes every 3 months, and in each of the 3 medium-resolution modes every 6 months, using the same high-declination calibration standard, and ratio the results to the first observations to detect any trends. Perform all exposures at both central and E1 detector positions.

Fraction GO/GTO Programs Supported   60%

Resources Required: Observation   10 external orbits

Resources Required: Analysis   3 FTE weeks

Products   Interim reports and ISRs on sensitivity. Wavelength dependent trends for implementation of pipeline corrections (based on CTE).

Accuracy Goals   Minimum S/N of 50 at the wavelength of least sensitivity.

Scheduling & Special Requirements   L modes monthly for first 3 months, then once every 3 months. M modes twice in first 6 months then once more in 2nd half of C17. Start the monitor around 13 Jul 09, finish with one L mode observation in 2010.

Notes: Front load monitors into beginning of C17. If there are reasons to maintain higher frequency put this request into supplemental calibration plan.

Proposal ID 11859: MAMA Dispersion Solutions
P.I. D. Lennon

Purpose Obtain wavecals just deep enough to constrain wavelength and spatial distortion maps without overusing the calibration lamp.

Description Wavelength dispersion solutions will be determined on a yearly basis as part of a long-term monitoring program. Deep engineering wavecals for each MAMA grating will be obtained at common cenwaves. Intermediate settings will also be taken to check the reliability of derived dispersion solutions. Final selection to be determined on basis of past monitoring and C17 requirements. The internal wavelength calibrations will be taken using the LINE line lamp. Extra-deep wavecals are included for echelle modes to ensure detection of weak lines. The can also be used by Tom Ayres' archive program (11743) which may provide improved dispersion solutions compared to pipeline.

Fraction GO/GTO Programs Supported 70%

Resources Required: Observation 10 internal and 3 parallel orbits

Resources Required: Analysis 4 FTE weeks

Products dispersion (_dsp) reference files, ISR

Accuracy Goals 0.1 pixels

Scheduling & Special Requirements Front load towards beginning of C17.

Notes: Match deep wavecals to previous monitoring programs and optimize for C17. If changes in dispersion solutions are apparent revise resources as part of supplemental calibration plan. Opportunity for Tom Ayres' archive proposal (11743) to make use of C17 data for improved wavelength calibration of echelle data. Deep wavecals are also important to exploit improvements in NUV line-list to be delivered by ST-ECF.

Proposal ID 11856: MAMA Full-field Sensitivity
P.I. C. Proffitt

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 also monitor the 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 flatfielding.

Fraction GO/GTO Programs Supported   70%

Resources Required: Observation   3 external orbits

Resources Required: Analysis   2 FTE weeks

Products   ISRs, photometric and astrometric accuracy and stability information for GOs and reference files

Accuracy Goals   1% counting statistcs S/N on bright stars

Scheduling & Special Requirements

Notes: In C17 there is one STIS FUV TIMETAG imaging proposal. No other UV imaging. Do this once only.

Proposal ID 11860: MAMA Sensitivity and Focus Monitor
P.I. D. Lennon

Purpose Monitor sensitivity of each MAMA grating mode to detect any change due to contamination or other causes. Also monitor the STIS focus in a spectroscopic and an imaging mode.

Description Obtain exposures in each of the 2 low-resolution MAMA spectroscopic modes every month for first 3 months, thereafter every 3 months. The medium-resolution modes and the 4 echelle modes 2 months after SMOV, repeating the echelle modes 6 months later. Use unique calibration standards for each mode, and ratio the results to the first observations to detect any trends. In addition, each L sequence will be preceded by two spectroscopic ACQ/PEAKs with the CCD/G230LB and crossed linear patterns, with the purpose of measuring the focus (PSF across the dispersion as a function of UV wavelength); and each M sequence will be preceded by a CCD/F28X50OII direct image also to monitor the focus. Prism mode done twice (it's not checked during SMOV), first early in C17 and then 6 months later.

Fraction GO/GTO Programs Supported 70%

Resources Required: Observation 12 external orbits

Resources Required: Analysis 4 FTE weeks

Products Interim reports and ISR on sensitivity monitor. Wavelength-dependent trends for implementation as pipeline corrections. ISR on focus monitors. If the focus quality is found to degrade significantly, a separate program to take corrective action (such as an adjustment of the STIS tip/tilt mirror) may be implemented.

Accuracy Goals Minimum S/N of 50 at the wavelength of least sensitivity for L modes, and at the central wavelengths for M and E modes. 10% for focus changes, i.e FWHM of the profile across the dispersion.

Scheduling & Special Requirements L modes every month, first 3 months, then every 3rd month. E and M models 2 months after SMOV, E modes again after 6 more months. PRISM asap in C17, then 6 months later. Initiate sequence in Jul 09. Last L mode observation in 2010.

Notes: L modes more frequent as they are primary metrics of time dependent sensitivity changes. PRISM not used in C17 but not checked in SMOV. Expect frequency of these checks to be reduced in C18. STIS focus will now be checked as part of telescope calibration plan but no significant gain in taking this out of present program.

Proposal ID 11857: MAMA Dark Monitor
P.I. C. Proffitt

Purpose   This test performs the routine monitoring of the MAMA detector dark noise. This proposal will provide the primary means of checking on health of the MAMA detectors systems through frequent monitoring of the background count rate. The purpose is to look for evidence of change in the dark rate, indicative of detector problems developing. Follow-on to SMOV proposals 11402 and 11390. Modified scheduling requirements below to give better idea of how dark varies with T over short timescales. Also add two FUV MAMA dark blocks per year extending over 5-6 orbits of a single SAA-free interval to monitor increase in strength of glow as function of time since HV turn-on.

Description   Two times a week a 23min exposure is taken with the FUV and NUV MAMAs with the shutter closed. The exposures are taken in ACCUM mode. The length of the exposures is chosen to make them parallels. Two blocks of 5-6 orbits in SAA-free interval.

Fraction GO/GTO Programs Supported   70%

Resources Required: Observation   284 internal parallel orbits.

Resources Required: Analysis   3 FTE weeks

Products   CDBS DRK files; ISR

Accuracy Goals   1%

Scheduling & Special Requirements   Constrain a pair of observations such that each observation is done in different part of SAA-free period., e.g. make even numbered visit occur after the preceding odd numbered visit by 4-8 orbits.

Notes: Revised FUV/NUV scheduling requirements, and added dark blocks to monitor glow in FUV.

Proposal ID 11863: MAMA Fold Distribution

P.I. T. Wheeler

Purpose The performance of MAMA microchannel plates can be monitored using a MAMA fold analysis procedure. The fold analysis provides a measurement of the distribution of charge cloud sizes incident upon the anode giving 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. The procedure is implemented using special commanding and is the same for the FUV and NUV MAMAs with the exception of the gratings/aperture/lamp combinations used for the flat fields. The procedure is described in STIS ISR 98-02

Fraction GO/GTO Programs Supported 70%

Resources Required: Observation 4 internal orbits

Resources Required: Analysis 0.5 FTE weeks

Products The Engineering Team releases it's Fold Analysis findings bi-annually.

Accuracy Goals 95%

Scheduling & Special Requirements One visit per detector every six months

Notes: Unmodified plan.

Proposal ID 11861: MAMA FUV Flats

P.I. D. Lennon

Purpose This program will obtain FUV-MAMA flat-field observations with the Kr lamp for the construction of pixel-to-pixel flats with a S/N of 100 per low-res pixel.

Description This program will obtain a set of FUV-MAMA flat-field observations with sufficient counts to construct pixel-to-pixel flat fields (P-flats) for all modes. Approximately 10 visits will be required to construct a P-flat with S/N = 100 per low-res pixel. Experience with pre-flight and on-orbit monitoring flats show that the flat-field characteristics are in large measure color- and mode-independent, so that high-quality P-flats constructed with the G140M/1470 and 52X0.1 aperture

re should suffice for all FUV-MAMA spectroscopic and imaging programs. This calibration program calls for obtaining flats with G140M with 5 SLIT-STEP positions to illuminate regions of the detector normally shadowed by the slit fiducial bars. Include early check in Dec 2008 to check intensity of lamp and allow possible re-planning.

Fraction GO/GTO Programs Supported 35%

Resources Required: Observation 11 internal orbits

Resources Required: Analysis 4 FTE weeks

Products reference file (P-flat), ISR

Accuracy Goals 1.0% (0.5% if combined with previous P-flats). Accuracy is per low-res pixel (2x2 high res pixels)

Scheduling & Special Requirements Early in C17 to facilitate construction of p-flat. Allow 6 hours between individual visits. Check lamp intensity in Aug 09.

Notes: Construct p-flats as in STIS TIR 2002-3. Count rate will depend on lamp performance. Any significant degradation may lead to a call for additional data later in C17 as part of supplemental plan. See previous program 9624.

Proposal ID 11862: MAMA NUV Flats
P.I. D. Lennon

Purpose	This program will obtain NUV-MAMA flat-field observations with the D2 lamp for the construction of pixel-to-pixel flats with a S/N of 100 per low-res pixel.
Description	This program will obtain a set of NUV-MAMA flat-field observations with sufficient counts to construct pixel-to-pixel flat fields (P-flats) for all modes. Approximately 10 visits will be required to construct a P-flat with S/N = 100 per low-res pixel. Experience with pre-flight and on-orbit monitoring flats show that the flat-field characteristics are in large measure color- and mode-independent, so that high-quality P-flats constructed with the G230M/2176 and 52X0.5 aperture should suffice for all NUV-MAMA spectroscopic and imaging programs. This calibration program calls for obtaining flats with G230M with 5 SLIT-STEP positions to illuminate regions of the detector normally shadowed by the slit fiducial bars. Include early check in Dec 2008 to check intensity of lamp and allow possible re-planning.
Fraction GO/GTO Programs Supported	35%
Resources Required: Observation	11 internal orbits
Resources Required: Analysis	4 FTE weeks
Products	reference file (P-flat), ISR
Accuracy Goals	1.0% (0.5% if combined with previous P-flats). Accuracy is per low-res pixel (2x2 high res pixels)
Scheduling & Special Requirements	Early in C17 to facilitate construction of p-flat. Allow 6 hours between individual visits. Check lamp intensity in Aug 09.

Notes: Construct p-flats as in STIS TIR 2002-3. Count rate will depend on lamp performance. Any significant degradation may lead to a call for additional data later in C17 as part of supplemental plan. See previous program 9625.

Proposal ID 11865: COS Flux Standard
P.I. R. Bohlin

Purpose   This program will obtain NUV/FUV-MAMA observations of the primary COS flux standard LDS749B

Description   None of the bright STIS flux standards will observed by COS in C17 so here we observe the faint primary COS flux standard LDS749B as a cross check in the STIS-COS flux calibration. Two orbits are required to obtain L mode observations in the FUV and NUV ranges. An L mode optical spectrum with the CCD can be obtained at no extra cost and will provide an additional check on CTE at low signal levels.

Fraction GO/GTO Programs Supported   This supports calibration of all COS programs. 60% of STIS programs.

Resources Required: Observation   2 external orbits

Resources Required: Analysis   3 FTE weeks

Products   ISR

Accuracy Goals   1-2% spectrophotometry

Scheduling & Special Requirements   Early in C17

Notes: Included at the request of Tony Keyes: COS will not observe the primary STIS UV standard.

Proposal ID 11866: Echelle grating blaze function zero points
P.I. A. Aloisi

Purpose	We will observe the flux standard G191B2B, obtaining echelle spectra in all primary and intermediate wavelength settings. While this was done in cycle 10 (8915) , the echelle blaze shift has proved to depend sensitively on both time and the exact MSM positioning. We therefore believe it is important to obtain a complete set of post-repair data to allow a comprehensive solution for the echelle blaze shifts.
Description	Correction for the blaze function is critical for accurate flux calibration and merging of echelle orders. We will obtain a peak S/N ratio of 30 per resolution element for E140M, E140H, and E230M, and a peak S/N ratio of 20 for E230H. The spectra will be noisier than previous flux calibration data, but all central wavelengths will be covered with sufficient S/N to obtain sensitivity curves accurate to better than 0.1% for all echelle orders. In addition the most commonly used modes will be obtained at s/n~100 to remove outstanding residuals (~5%) at short wavelengths which have been reported in previous science data.
Fraction GO/GTO Programs Supported	38%
Resources Required: Observation	24 external orbits
Resources Required: Analysis	4 FTE weeks
Products	CDBS reference files
Accuracy Goals	S/N of 20-30 for all modes, and ~100 for common FUV modes.
Scheduling & Special Requirements	Early in cycle 17

Notes: Most commonly used FUV echelle modes in C17 are E140H/1234, E140M/1425, E140H/1343.