



11934 - UVIS G280 Flux Calibration

Cycle: 17, Proposal Category: CAL/WFC3

(Availability Mode: RESTRICTED)

INVESTIGATORS

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VISITS

<i>Visit</i>	<i>Targets used in Visit</i>	<i>Configurations used in Visit</i>	<i>Orbits Used</i>	<i>Last Orbit Planner Run</i>	<i>OP Current with Visit?</i>
01	(1) GD-71 BIAS	WFC3/UVIS	1	18-Mar-2009 21:30:21.0	yes

1 Total Orbits Used

ABSTRACT

Flux calibration, image displacement, and spectral trace of the UVIS G280 grism will be established using observations of the HST flux standard start GD71. Accompanying direct exposures will provide the image displacement measurements and wavelength zeropoints for dispersed exposures. The calibrations will be obtained at the central position of each CCD chip and at the center of the UVIS field. No additional field-dependent variations will be derived.

OBSERVING DESCRIPTION

We will obtain observations of the HST primary flux standard star GD71 in order to establish the flux calibration of the UVIS G280 grism and also provide image displacement and spectral trace information. The standard star will be observed at a central position for each of the two CCD chips, as well as near the center of the whole UVIS field of view, in sequences of three exposures: 2 direct images in the F200LP and F300X filters, followed by the G280 dispersed exposure. The direct images are needed to establish the image displacement and wavelength zero-point. We will not consider field-dependent variations in the flux calibration because this would require many more orbits. Furthermore, there is only one GO snapshot program in Cycle 17 that uses the G280 and in that program a single target will be placed at the same field position in each exposure. Bias exposures are also obtained to support the off-nominal chip 2 subarray readouts that will be used.

CALIBRATION JUSTIFICATION

Determining the sensitivity curve of the G280 grism is a fundamental calibration of the grism mode that will be needed to calibrate science observations using the G280. The ratio of the known GD71 flux distribution to the observed countrate spectrum determines the inverse sensitivity curve for the G280 instrument mode. Application of this sensitivity curve to all other G280 spectra places those spectra on an absolute flux scale. The spectral trace and image offset information that will be derived from the GD71 continuum spectrum is needed as input to the ST-ECF aXe spectral extraction software, in order to guide the extraction of all spectral data from G280 images. The goal is to calibrate the G280 sensitivity curve of the G280 to <10% (1-sigma) over the wavelength range 1900-3500 A in the +1 and -1 orders. Sensitivity curves will also be established for higher orders, but with reduced accuracy.

Calibration products: Derivation of all calibration products will be performed by the ST-ECF WFC3 grism support group. The inverse sensitivity curve, spectral trace, and image offset information will all be used in the aXe spectral extraction software. The inverse sensitivity curve will also be used to update the G280 throughput curve in the STScI CDBS, which is in turn used by Synphot and the WFC3 ETC.

Proposal 11934 - Visit 01 - UVIS G280 Flux Calibration

Thu Mar 19 01:30:26 GMT 2009

Visit	<p>Proposal 11934, Visit 01</p> <p>Diagnostic Status: No Diagnostics</p> <p>Scientific Instruments: WFC3/UVIS</p> <p>Special Requirements: BETWEEN 01-AUG-2009:00:00:00 AND 15-SEP-2009:00:00:00</p> <p><i>Comments: Exposures of GD71 in the F200LP, F300X, and G280. The sequence of 3 exposures is repeated at each position in the field. Field positions include the center of each CCD chip, as well as the nominal "UVIS" field center location. Because the only aperture allowed to be used with the G280 is the "UVIS", we must use postargs to move the target to each of the two chip center positions. The nominal "UVIS" aperture puts the target 10" above the chip gap on chip 1. A Y-postarg of about 30" will put the target near the center of chip 1 and a Y-postarg of about -50" will put it near the center of chip 2.</i></p> <p><i>The optional parameter SIZEAXIS2=768 is used for all exposures to minimize the data volume and hence time lost to buffer dumps. This is fine for the data that needs to be obtained because the spectrum of GD71 will occupy only a narrow swath of pixel rows within the field. This also requires the use of optional parameter CENTERAXIS2 in order to "steer" the location of the subarray readout so that it is centered on the target location. For the chip 1 (center) exposures, CENTERAXIS2=TARGET will place the vertical center of the subarray on the target location. For the field center (nominal "UVIS" aperture) location, we can't center the subarray on the target because this would cause the subarray to extend into the chip gap, so we hardwire CENTERAXIS2=2438, which puts the bottom of the subarray within a couple rows of the bottom of chip 1. We also have to hardwire CENTERAXIS2=1026 for the exposures with the target near the center of chip 2, because using CENTERAXIS2=TARGET does not seem to work properly. This value for CENTERAXIS2 puts the vertical center of the subarray at the vertical center of chip 2.</i></p> <p><i>The very short direct exposures do not use CR-SPLIT because that would drive up the data volume and the number of CR's in such a short exposure time will be minimal. A simple 3-position line dither pattern is used for the G280 exposures, in order to improve sampling and reject CR's.</i></p> <p><i>Chip 2 biases are taken at the end of the visit because the grism exposures use custom subarrays, which will not have matching biases from the WFC3 bias calibration program. Chip 1 amp-B biases will be available from the bias calibration program.</i></p> <p><i>This visit should happen sometime within the first 6 weeks of Cycle 17, in order to make the calibrations available to support science, therefore a timing requirement is used to place them between 1 Aug 2009 and 15 Sep 2009.</i></p>										
	Patterns	#	Primary Pattern				Secondary Pattern				Exposures
		(1)	Pattern Type=WFC3-UVIS-DITHER-LINE Purpose=DITHER Number Of Points=3 Point Spacing=0.145 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=46.84 Angle Between Sides= Center Pattern=false					(3), (6), (9)		
	Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections			Fluxes	Miscellaneous		
(1)		GD-71	RA: 05 52 27.6300 (88.1151250d) Dec: +15 53 13.37 (15.88705d) Equinox: J2000				V=13.06	Reference Frame: ICRS			
<p><i>Comments: GD-71 and GD-153 are primary HST flux standards that have been used in the past to calibrate the NICMOS and ACS grism modes, which provides us with the ability to cross-calibrate between instruments. GD-71 is specifically chosen for the WFC3 IR grism calibration because it will provide a second flux calibration target (GD-153 is used in SMOV for the IR grism calibration), so that the calibration is not based on a single target. A second calibration target also minimizes the potential for problems from other nearby sources in the field. GD-71 is then chosen for this UVIS grism calibration program so that the same calibration target is used for both channels.</i></p>											
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit	
	1	Chip 1 F200 LP	(1) GD-71	WFC3/UVIS, ACCUM, G280-REF	F200LP	SIZEAXIS2=768; CR-SPLIT=NO; CENTERAXIS2=T ARGET; AMP=B	POS TARG 0.0,30.0		0.5 Secs [==>]	[1]	

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#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
Exposures (continued)	2	Chip 1 F300 X	(1) GD-71	WFC3/UVIS, ACCUM, G280-REF	F300X	SIZEAXIS2=768; CR-SPLIT=NO; CENTERAXIS2=T ARGET; AMP=B	POS TARG 0.0,30.0	0.5 Secs [==>]	[1]
	3	Chip 1 G280	(1) GD-71	WFC3/UVIS, ACCUM, UVIS	G280	CR-SPLIT=NO; SIZEAXIS2=768; CENTERAXIS2=T ARGET; AMP=B	POS TARG 0.0,30.0	Pattern 3-3 (1) 10 Secs [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]	[1]
	4	Chip 2 F200 LP	(1) GD-71	WFC3/UVIS, ACCUM, G280-REF	F200LP	SIZEAXIS2=768; CR-SPLIT=NO; CENTERAXIS2=10 26; AMP=D	POS TARG 0.0,-50. 0	0.5 Secs [==>]	[1]
	5	Chip 2 F300 X	(1) GD-71	WFC3/UVIS, ACCUM, G280-REF	F300X	SIZEAXIS2=768; CR-SPLIT=NO; CENTERAXIS2=10 26; AMP=D	POS TARG 0.0,-50. 0	0.5 Secs [==>]	[1]
	6	Chip 2 G280	(1) GD-71	WFC3/UVIS, ACCUM, UVIS	G280	CR-SPLIT=NO; SIZEAXIS2=768; CENTERAXIS2=10 26; AMP=D	POS TARG 0.0,-50. 0	Pattern 6-6 (1) 10 Secs [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]	[1]
	7	Center F200 LP	(1) GD-71	WFC3/UVIS, ACCUM, G280-REF	F200LP	SIZEAXIS2=768; CR-SPLIT=NO; CENTERAXIS2=24 38; AMP=B	POS TARG 0.0,0.0	0.5 Secs [==>]	[1]
	8	Center F300 X	(1) GD-71	WFC3/UVIS, ACCUM, G280-REF	F300X	SIZEAXIS2=768; CR-SPLIT=NO; CENTERAXIS2=24 38; AMP=B	POS TARG 0.0,0.0	0.5 Secs [==>]	[1]
	9	Center G280	(1) GD-71	WFC3/UVIS, ACCUM, UVIS	G280	CR-SPLIT=NO; SIZEAXIS2=768; CENTERAXIS2=24 38; AMP=B	POS TARG 0.0,0.0	Pattern 9-9 (1) 10 Secs [==>(Pattern 1)] [==>(Pattern 2)] [==>(Pattern 3)]	[1]

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Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	10	Chip 2 Bias	BIAS	WFC3/UVIS, ACCUM, UVIS2-2K4-SUB	DEF				0.0 Secs X 2 <i>[==>(Copy 1)]</i> <i>[==>(Copy 2)]</i>	<i>[1]</i>

