



12561 - The Weight-Watch Program for Subdwarfs

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Wei-Chun Jao (PI) (Contact)	Georgia State University Research Foundation	jao@chara.gsu.edu
Dr. Todd J. Henry (CoI)	Georgia State University Research Foundation	thenry@chara.gsu.edu
Dr. Edmund Nelan (CoI)	Space Telescope Science Institute	nelan@stsci.edu
Dr. Otto G. Franz (CoI)	Lowell Observatory	otto.franz@lowell.edu
Dr. Lawrence H. Wasserman (CoI)	Lowell Observatory	l.h.wasserman@lowell.edu

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) G006-026BC	FGS	1	18-Nov-2013 21:01:00.0	yes
02	(1) G006-026BC	FGS	1	18-Nov-2013 21:01:05.0	yes
04	(1) G006-026BC	FGS	1	18-Nov-2013 21:01:08.0	yes
05	(1) G006-026BC	FGS	1	18-Nov-2013 21:01:10.0	yes
06	(1) G006-026BC	FGS	1	18-Nov-2013 21:01:12.0	yes

5 Total Orbits Used

ABSTRACT

The mass-luminosity relation (MLR) is one of the most important map in stellar astronomy. The empirical MLR for dwarfs has been done for many years, but we do not even have enough low metallicity stars, the counterpart of dwarfs, for their MLR. This project of "Weight-Watch Program for Subdwarfs" is to establish such empirical MLR for low metallicity stars. We propose to use HST/FGS1r to finish mapping the visual orbit of one

important benchmark low metallicity binary, G006-026. We resolved this double-lined spectroscopic binary in our Cycle 15 HST/FGS program. By combining the SB2 data and our single-epoch HST/FGS1r result, we have estimated their masses and visual orbit, but with errors in excess of 10%. By combining that effort with four additional orbits proposed in Cycle 19, we will reduce the mass errors to 5% (or less) and finish this star's "Weight-Watch program".

OBSERVING DESCRIPTION

We will use FGS1r in its high angular resolution observing "TRANS" mode to resolve the tight SB2 binary system G006-026. This system has a semi-major axis of only 23 mas. But given the eccentricity of ~ 1.5 , a favorable viewing angle (little ω), and inclination, carefully timed FGS observations can be executed whereby the projected angular separation of the binary components will exceed a precisely measured ~ 13 mas on each FGS axis, thereby yielding an accurate component separation and position angle at each observing epoch. The dates of the observations are carefully set to achieve these results.

We have updated the phase2 proposal with a change to the observations to be executed in Jan 2014. Using the "coron" option, we have split the orbit into two visits, each with its own "orient", and a relative roll between the visits of 44 degrees. Combining the data from the two different spacecraft orientations should lead to a reliable determination of the binary position angle and angular separation, which has eluded previous visits since the binary was resolved only along one FGS axis, which left the PA and separations with unusable large errors.

Proposal 12561 - Visit 01 - The Weight-Watch Program for Subdwarfs

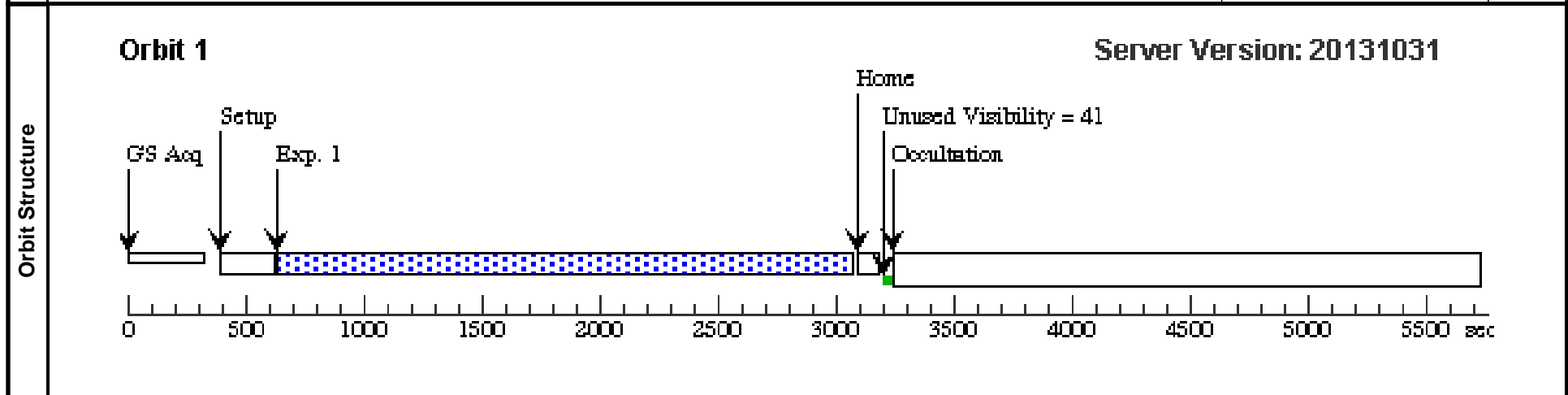
Tue Nov 19 02:01:19 GMT 2013

Visit	Proposal 12561, Visit 01, completed Diagnostic Status: Warning Scientific Instruments: FGS Special Requirements: ORIENT 260.0D TO 262.0 D; BETWEEN 29-OCT-2011 AND 03-NOV-2011
	(Visit 01) Warning (Orbit Planner): SHORT FGS SCAN LENGTH MAY SIGNAL PROBLEMS

Diagnosics	(Visit 01) Warning (Orbit Planner): SHORT FGS SCAN LENGTH MAY SIGNAL PROBLEMS

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
		(1)	G006-026BC	RA: 03 39 34.9300 (54.8955417d) Dec: +18 18 51.80 (18.31439d) Equinox: J2000		V=12.71

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
		1		(1) G006-026BC	FGS, TRANS, 1	F583W	SCANS=30; STEP-SIZE=0.3			2000 Secs (2000 Secs) [==>]



Proposal 12561 - Visit 02 - The Weight-Watch Program for Subdwarfs

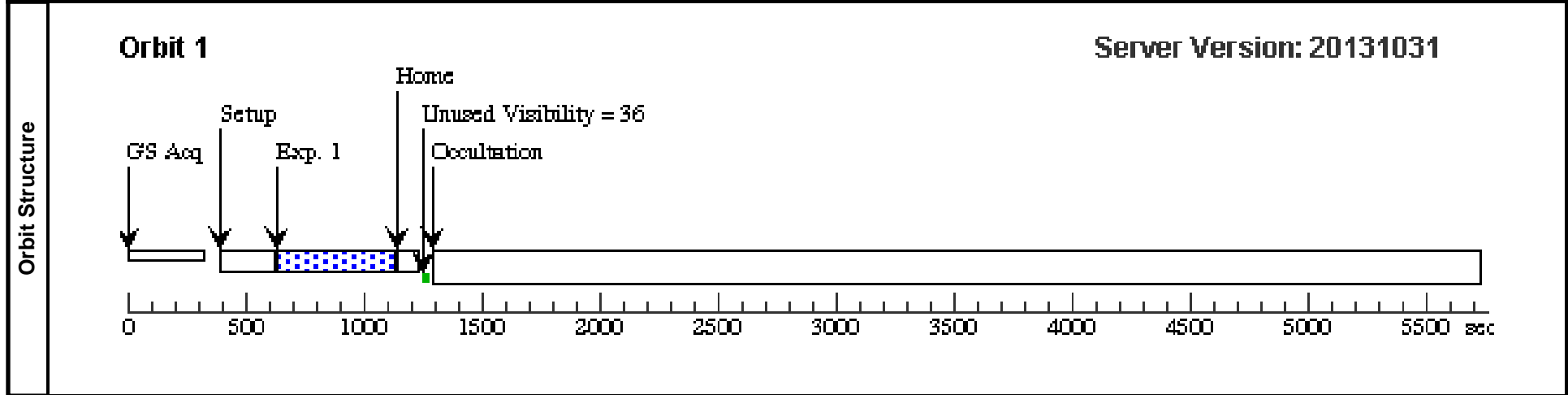
Tue Nov 19 02:01:21 GMT 2013

Visit	Proposal 12561, Visit 02, pi Diagnostic Status: Warning Scientific Instruments: FGS Special Requirements: ORIENT 54.0D TO 55.0 D; BETWEEN 26-DEC-2013 AND 16-JAN-2014; VISIBILITY INTERVAL CORON <i>Comments: visit 02 and visit 06 are intended to execute within the same HST orbit. Each has its own orient, so there is a roll change between the visits.</i>
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Diagnostics	(Visit 02) Warning (Orbit Planner): SHORT FGS SCAN LENGTH MAY SIGNAL PROBLEMS
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Fixed Targets	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Fluxes</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(1)</td> <td>G006-026BC</td> <td>RA: 03 39 34.9300 (54.8955417d) Dec: +18 18 51.80 (18.31439d) Equinox: J2000</td> <td></td> <td>V=12.71</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table>	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	G006-026BC	RA: 03 39 34.9300 (54.8955417d) Dec: +18 18 51.80 (18.31439d) Equinox: J2000		V=12.71	Reference Frame: ICRS
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(1)	G006-026BC	RA: 03 39 34.9300 (54.8955417d) Dec: +18 18 51.80 (18.31439d) Equinox: J2000		V=12.71	Reference Frame: ICRS								

Exposures	<table border="1"> <thead> <tr> <th>#</th> <th>Label</th> <th>Target</th> <th>Config,Mode,Aperture</th> <th>Spectral Els.</th> <th>Opt. Params.</th> <th>Special Reqs.</th> <th>Groups</th> <th>Exp. Time (Total)/[Actual Dur.]</th> <th>Orbit</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td>(1) G006-026BC</td> <td>FGS, TRANS, 1</td> <td>F583W</td> <td>SCANS=10; STEP-SIZE=0.6</td> <td></td> <td></td> <td>300 Secs (300 Secs) [==>]</td> <td>[1]</td> </tr> </tbody> </table>	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit	1		(1) G006-026BC	FGS, TRANS, 1	F583W	SCANS=10; STEP-SIZE=0.6			300 Secs (300 Secs) [==>]	[1]
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1		(1) G006-026BC	FGS, TRANS, 1	F583W	SCANS=10; STEP-SIZE=0.6			300 Secs (300 Secs) [==>]	[1]												



Proposal 12561 - Visit 04 - The Weight-Watch Program for Subdwarfs

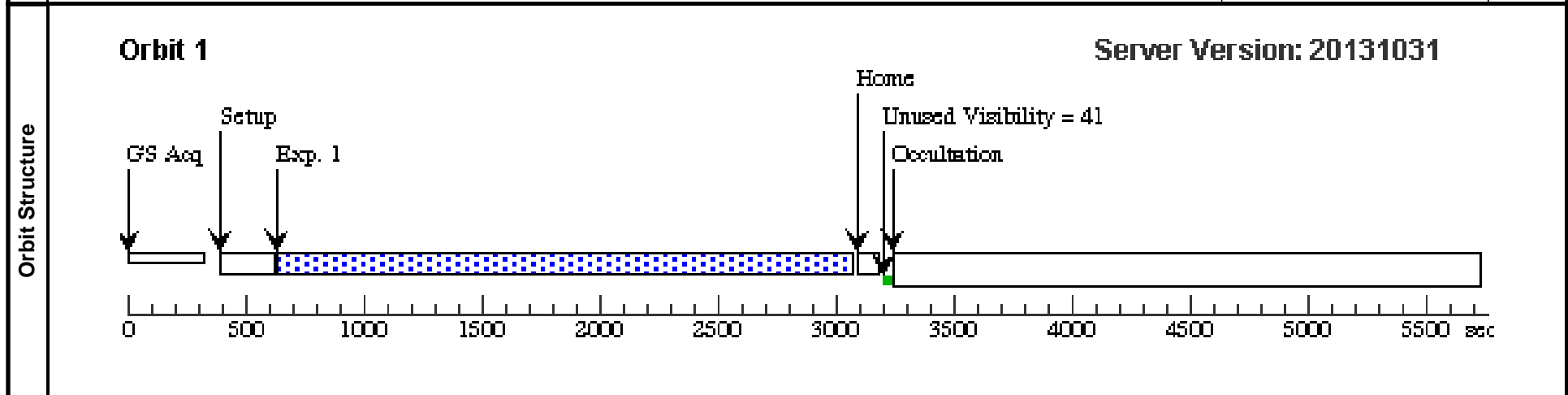
Tue Nov 19 02:01:22 GMT 2013

Visit	Proposal 12561, Visit 04, completed Diagnostic Status: Warning Scientific Instruments: FGS Special Requirements: ORIENT 70.0D TO 74.0 D; BETWEEN 29-JAN-2013 AND 03-FEB-2013
	(Visit 04) Warning (Orbit Planner): SHORT FGS SCAN LENGTH MAY SIGNAL PROBLEMS

Diagnostics	(Visit 04) Warning (Orbit Planner): SHORT FGS SCAN LENGTH MAY SIGNAL PROBLEMS

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	G006-026BC	RA: 03 39 34.9300 (54.8955417d) Dec: +18 18 51.80 (18.31439d) Equinox: J2000		V=12.71	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) G006-026BC	FGS, TRANS, 1	F583W	SCANS=30; STEP-SIZE=0.3			2000 Secs (2000 Secs) [==>]	[1]



Proposal 12561 - Visit 05 - The Weight-Watch Program for Subdwarfs

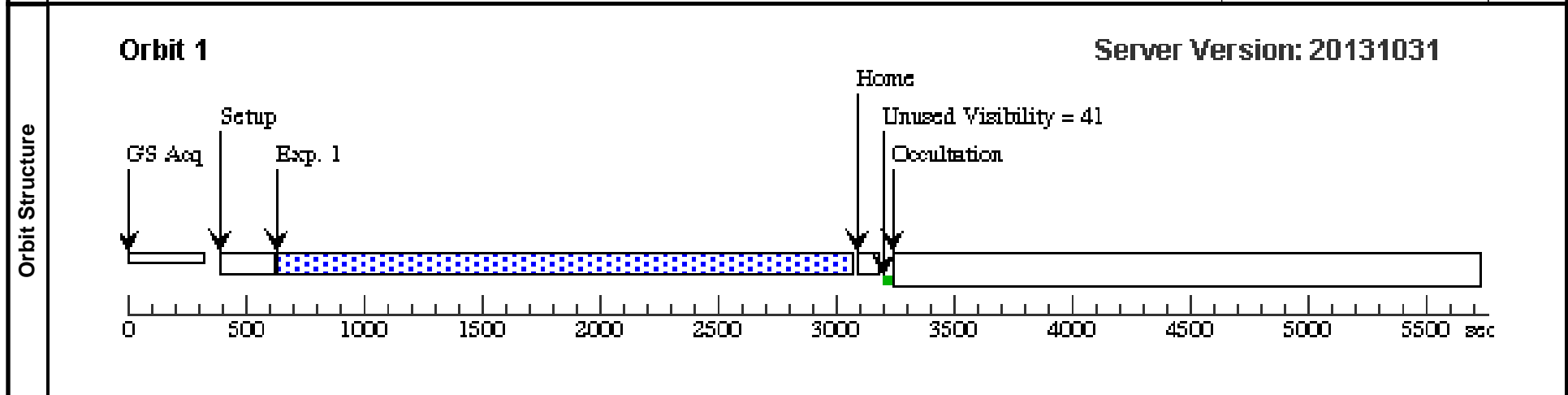
Tue Nov 19 02:01:22 GMT 2013

Visit	Proposal 12561, Visit 05, completed Diagnostic Status: Warning Scientific Instruments: FGS Special Requirements: ORIENT 63.0D TO 67.0 D; BETWEEN 13-FEB-2013 AND 17-FEB-2013
	(Visit 05) Warning (Orbit Planner): SHORT FGS SCAN LENGTH MAY SIGNAL PROBLEMS

Diagnostics	(Visit 05) Warning (Orbit Planner): SHORT FGS SCAN LENGTH MAY SIGNAL PROBLEMS

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	G006-026BC	RA: 03 39 34.9300 (54.8955417d) Dec: +18 18 51.80 (18.31439d) Equinox: J2000		V=12.71	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) G006-026BC	FGS, TRANS, 1	F583W	SCANS=30; STEP-SIZE=0.3			2000 Secs (2000 Secs) [==>]	[1]



Proposal 12561 - Visit 06 - The Weight-Watch Program for Subdwarfs

Tue Nov 19 02:01:23 GMT 2013

Visit	Proposal 12561, Visit 06 Diagnostic Status: Warning Scientific Instruments: FGS Special Requirements: ORIENT 96.0D TO 98.0 D; AFTER 02 BY 0 Orbits TO 1 Orbits; GROUP 06.02 WITHIN 1H; VISIBILITY INTERVAL CORON
	(Visit 06) Warning (Orbit Planner): SHORT FGS SCAN LENGTH MAY SIGNAL PROBLEMS

Diagnostics	(Visit 06) Warning (Orbit Planner): SHORT FGS SCAN LENGTH MAY SIGNAL PROBLEMS

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	G006-026BC	RA: 03 39 34.9300 (54.8955417d) Dec: +18 18 51.80 (18.31439d) Equinox: J2000		V=12.71	Reference Frame: ICRS

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1		(1) G006-026BC	FGS, TRANS, 1	F583W	SCANS=10; STEP-SIZE=0.6			300 Secs (300 Secs) [==>]	[1]

