



13697 - Does star formation proceed differently in metal-poor galaxies?

Cycle: 22, Proposal Category: GO

(UV Initiative)

(Availability Mode: SUPPORTED)

INVESTIGATORS

<i>Name</i>	<i>Institution</i>	<i>E-Mail</i>
Dr. Vianney Lebouteiller (PI) (ESA Member) (Contact)	CEA/DSM/Irfu/Service d'Astrophysique - Laboratoire AIM	vianney.lebouteiller@cea.fr
Dr. Suzanne Madden (CoI) (ESA Member)	CEA/DSM/DAPNIA/Service d'Astrophysique	suzanne.madden@cea.fr
Dr. Alessandra Aloisi (CoI)	Space Telescope Science Institute	aloisi@stsci.edu
Dr. Bethan James (CoI) (ESA Member)	University of Cambridge	bjames@ast.cam.ac.uk
Dr. Sara R. Heap (CoI) (AdminUSPI) (Contact)	NASA Goddard Space Flight Center	sara.r.heap@nasa.gov
Dr. Diane Cormier (CoI) (ESA Member)	Universitat Heidelberg	diane.cormier@zah.uni-heidelberg.de
Aurelie Remy (CoI) (ESA Member)	CEA/DSM/DAPNIA/Service d'Astrophysique	aurelie.remy@cea.fr
Dr. Frederic Galliano (CoI) (ESA Member)	CEA/DSM/DAPNIA/Service d'Astrophysique	frederic.galliano@cea.fr
Dr. Daniel Kunth (CoI) (ESA Member)	CNRS, Institut d'Astrophysique de Paris	kunth@iap.fr
Dr. Nicolas Lehner (CoI)	University of Notre Dame	nlehner@nd.edu
Dr. Ivan Hubeny (CoI)	University of Arizona	hubeny@as.arizona.edu
Prof. Michael J. Barlow (CoI) (ESA Member)	University College London	mjb@star.ucl.ac.uk
Dr. Oskar Karczewski (CoI) (ESA Member)	University of Sussex	o.l.karczewski@sussex.ac.uk
Dr. Simon Glover (CoI) (ESA Member)	Universitat Heidelberg	glover@uni-heidelberg.de
Dr. Franck Le Petit (CoI) (ESA Member)	Observatoire de Paris - Section de Meudon	francklepetit@obspm.fr
Jacques Le Bourlot (CoI) (ESA Member)	Observatoire de Paris - Section de Meudon	jacques.lebourlot@obspm.fr

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) NGC-1140	COS/FUV COS/NUV	1	01-Dec-2014 21:01:02.0	yes
02	(2) HE2-10	COS/FUV COS/NUV	1	01-Dec-2014 21:01:04.0	yes
03	(3) HARO2	COS/FUV COS/NUV	1	01-Dec-2014 21:01:06.0	yes
04	(4) NGC-4861	COS/FUV COS/NUV	1	01-Dec-2014 21:01:08.0	yes
05	(5) HARO3	COS/FUV COS/NUV	1	01-Dec-2014 21:01:10.0	yes
06	(6) MRK-153	COS/FUV COS/NUV	1	01-Dec-2014 21:01:12.0	yes
07	(7) MRK-1450	COS/FUV COS/NUV	2	01-Dec-2014 21:01:14.0	yes
08	(8) SBS1533+574	COS/FUV COS/NUV	2	01-Dec-2014 21:01:19.0	yes
09	(9) NGC-1705	COS/FUV COS/NUV	1	01-Dec-2014 21:01:21.0	yes

11 Total Orbits Used

ABSTRACT

The importance of molecular gas in the star-formation process has been questioned by recent theoretical studies. When metals are scarce, star formation could proceed before the molecular fraction becomes significant, making cold atomic gas the key pre-requisite for star formation. The best case studies are blue compact dwarf galaxies (BCDs), with their prominent star-formation episode and yet with little or no evidence of molecular gas. Current observations do not provide strong constraints on the presence of dense atomic gas in BCDs nor on the fraction of molecular gas.

We propose to examine the HI region of 9 nearby BCDs selected from the Herschel Dwarf Galaxy Survey. Our program relies on the synergy of Hubble and Herschel, by calculating the gas cooling rate from the fine-structure level of ionized carbon, a parameter that can be determined both in

the FUV with COS (probing the diffuse gas through the 1335.7Å CII* absorption) and in the FIR with Herschel (probing the denser gas through the [CII] 157µm emission). This comparison allows us to constrain the volume filling factor of dense vs. diffuse gas. The program we propose will allow us to examine how this fraction varies with metallicity, star-formation rate, and total gas mass. We will also be able to quantify the mass of molecular gas and evaluate its actual importance for star formation. Finally, a secondary objective is to characterize the main gas heating mechanisms in the HI region of BCDs and in particular the validity of the photoelectric effect paradigm in sources with a low dust-to-gas ratio, with potential implications for high-redshift galaxies.

OBSERVING DESCRIPTION

Tracers

The main tracers in our project are the absorption lines C II * 1335.7 and H I Ly-alpha. These lines will be used to calculate the diffuse gas cooling rate per H atom, following the method used in Damped Ly-alpha systems (Lehner et al. 2004; Wolfe et al. 2003a,b). COS is the only instrument to observe C II* in Blue Compact Dwarfs (BCDs) and to carry our research program through.

In order to calculate the gas density in the diffuse phase, we also need in principle C II 1334.5 since the C II*/C II ratio depends on the density of collision partners (free electrons or H atoms). In most cases, C II will be heavily saturated, so we will use the S II column density as a tracer, assuming that the C/S abundance ratio measured in the H II region from optical emission-lines holds in the H I region (following Bowen et al. 2005 and Lebouteiller et al. 2013).

We will also derive chemical abundances using S II , N I , O I , Si II, and Fe II lines. The metallicity of the H I region will be calculated in order to correct the comparison of cooling rates in the diffuse vs. dense gas for potential abundance inhomogeneities. Previous studies with the FUSE telescope showed that a discontinuity is often present in BCDs, implying the existence of metal-free gas in the outskirts of galaxies (results reviewed in Lebouteiller et al. 2009 and Lebouteiller et al. 2013). The greater sensitivity of COS as compared to FUSE enables access to much weaker lines, thereby avoiding possible "hidden saturation" effects that plague extragalactic absorption-line studies (Lebouteiller et al. 2013; James et al. in prep.).

We have selected several sources with moderate metallicities ($Z > 1/5 Z_{\text{solar}}$) in which we expect to detect several H₂ absorption lines, in particular at 1108Å. We will use these lines to compute the diffuse H₂ column density.

The G130M grating will be used with central wavelengths 1222AA and 1291AA. Our phase I proposal used only 1222AA, but Ly-alpha falls partly in the gap between the 2 segments. Therefore, we propose to perform one set of exposures with central wavelength 1222AA to get all the tracers except Ly-alpha, and another set centered at 1291AA to get Ly-alpha. The latter observation is rather short, since the data can be heavily rebinned to measure the broad Ly-alpha damping wing profile. The G130M grating provides a larger spectral resolution and larger effective area as compared to G140L. This is extremely important to disentangle C II* to C II.

All sources in our sample have been detected in [C II] 157 um (Figure 4) and [O I] 63 um with Herschel. We also have ancillary H I 21 cm measurements to compare to our H I column density determination from Ly-alpha. The D/G ratio has been measured accurately for the first time with Herschel (Remy-Ruyer et al. 2013). Spitzer tracers (in particular PAH emission and [Si II]) are available for all sources through the Spitzer/IRS CASSIS database (Lebouteiller et al. 2011). CO(1-0) has been observed for all sources and is detected in 4/9 sources.

Sample

From the initial 40 sources of the Dwarf Galaxy Survey (DGS), we first selected the most compact sources to minimize potential systematic errors in the comparison between COS (2.5 aperture) and Herschel observations (47" x 47" field-of-view, about 12 resolution). In two cases (NGC 4861 and NGC 1705), the objects are more extended than the COS aperture and we chose a pointing toward the massive stellar cluster. The contribution from the cluster to the Herschel [C II] flux is point-like and can be isolated from the extended emission.

Since we need to disentangle the BCD absorption lines from the Milky Way component, we also ignored objects with a radial velocity < 600 km s⁻¹. Accounting for the 4 DGS compact sources already observed with G130M on COS, our initial sample was made of 24 potential targets. We have then selected a sub-sample of bright sources spanning the full range of SFR, metallicity, and H I mass of BCDs.

Our sample is deliberately not biased toward the extreme low end of the BCD metallicity range for two reasons. First, the 2 lowest-metallicity sources in our nearby Universe, I Zw 18 and SBS 0335-052, were already observed by COS/G130M, leading to a first important step (Lebouteiller et al. 2013) serving as a basis for the present program. Furthermore, although such extreme objects do provide important constraints to test theories of star formation, they are rare in the nearby Universe, and only recently with ALMA are we able to detect very high-redshift Milky-Way like sources

that may harbor such low metallicities. Therefore, we also wish to include sources around $1/5 - 1/10 Z_{\text{solar}}$ that are more representative of a larger number of typical low-metallicity sources in the low-redshift Universe and that can serve as calibrators. In objects with moderate metallicities around or above $1/5 Z_{\text{solar}}$, we expect to measure a diffuse H₂ column density that we will use to calculate the molecular gas mass fraction to compare to our models. The final sample contains 9 BCDs, with distances between 5 Mpc and 50 Mpc.

Acquisition

The target coordinates have been refined since phase I mostly based on HST/STIS, WFC3, and SDSS images. We will use ACQ/SEARCH (followed by ACQ/IMAGE) for sources with uncertain coordinates (4/9 sources) either because they are somewhat extended or because several sources are located within 2-3". We will use only ACQ/IMAGE for the sources for which the coordinates are well known, mostly when the source is compact.

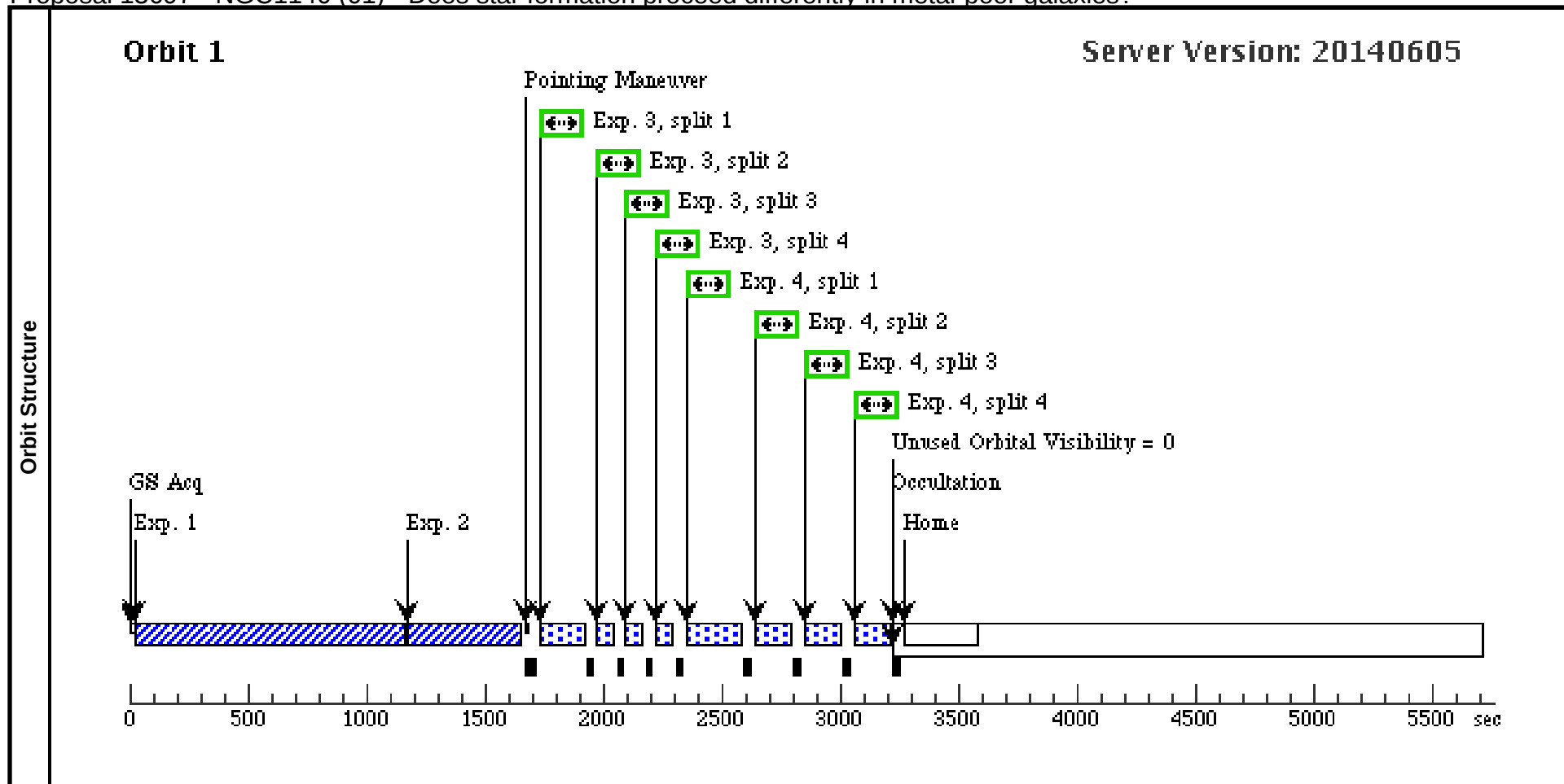
Exposure times

From the 4 compact DGS sources in the MAST database, including IZw18, we have calibrated the continuum flux density estimates around 1400Å. As a starting point, we used the GALEX FUV magnitude or the FUSE ($< 1200\text{Å}$) spectrum when possible. In most cases, most of the FUV emission is expected to fall into the COS aperture. A correction was performed for the other cases based on the FUV extent, since GALEX (or FUSE) observations have a poorer spatial resolution and a larger field-of-view. The required signal-to-noise ratio (S/N) is driven by the C II* detection. We first estimated the C II column density by using the galaxy metallicity $12 + \log(\text{O}/\text{H})$ together with the C/O ratio observed in the H II region. We then estimated the column density and optical depth of C II* by assuming a typical collision partner density based on our recent study (Lebouteiller et al. 2013). Our estimates were verified by using the 4 sources in the COS database as references. We also accounted for the fact that the absorption line can be broadened if the source illuminates partially or fully the aperture. The degraded spectral resolution is always sufficient to disentangle the C II and C II* profiles. Based on our estimates, C II* is always optically thin, except in a couple of cases for which it is expected to be somewhat saturated. For such cases, we will constrain the turbulent velocity using other metallic species arising in the same phase, in the fashion of previous FUSE and COS studies.

Exposure times were calculated with the COS ETC. Our results won't be affected if the spectral resolution is somewhat decreased in Cycle 22 due to the change of Lifetime Position to LP3. All the objects will be observed in a single visit, with 1 to 2 orbits, which will allow us to reach a S/N of about 15 per resolution element. We have included the overheads (guide star acquisition, target acquisition, exposure overhead) for the time calculation. Our program is a small GO program, with a total of 11 orbits.

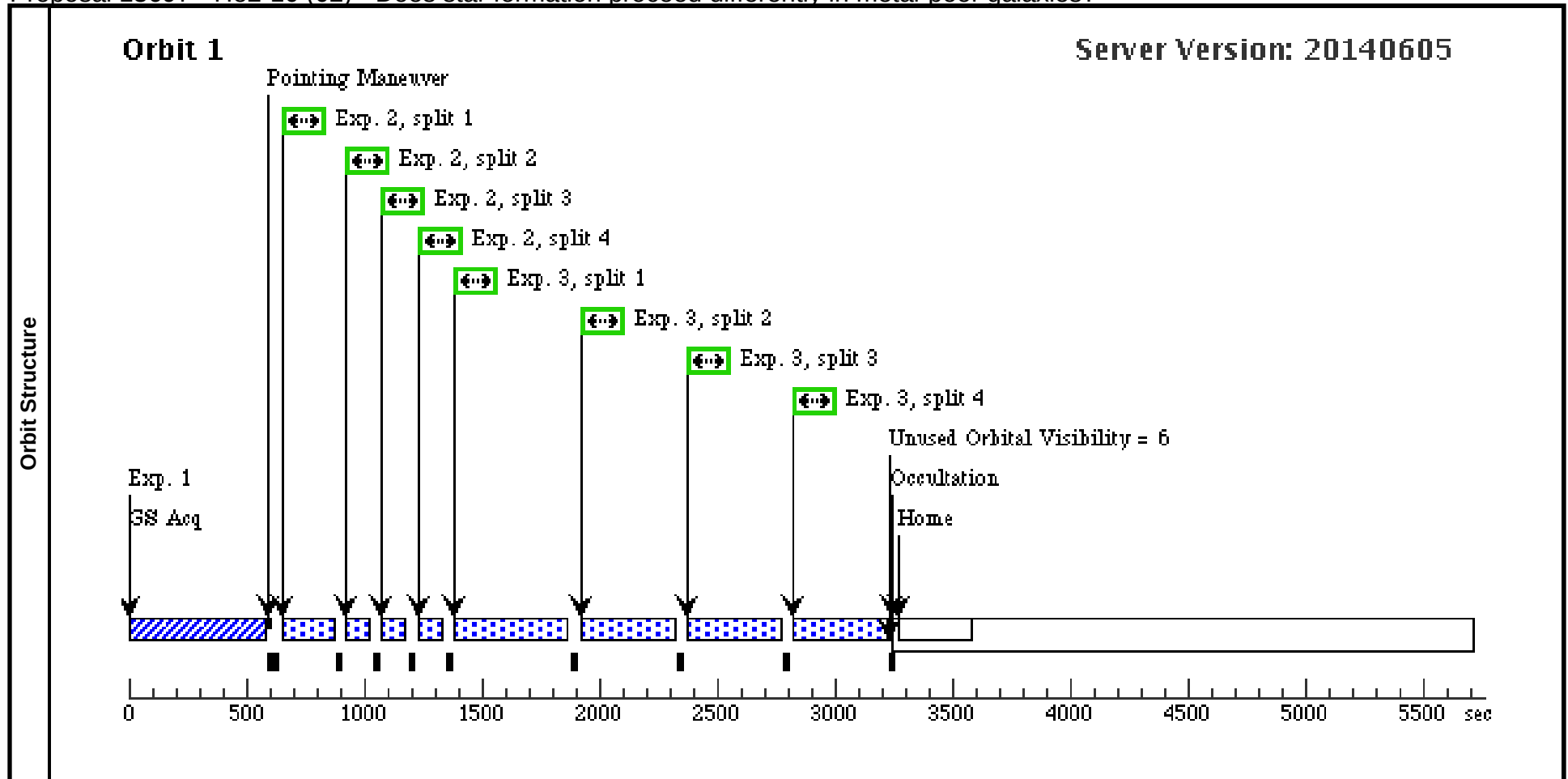
Proposal 13697 - NGC1140 (01) - Does star formation proceed differently in metal-poor galaxies?

Visit	Proposal 13697, NGC1140 (01), implementation								Tue Dec 02 02:01:22 GMT 2014	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: COS/NUV, COS/FUV									
	Special Requirements: (none)									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	NGC-1140	RA: 02 54 33.5500 (43.6397917d) Dec: -10 01 40.30 (-10.02786d) Equinox: J2000	Radial Velocity: 1501 km/sec	V=12.49 GALEX_FUV=14.3, F(1400)~6.31e-14, N(CII*)~14.6	Reference Frame: ICRS				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ngc1140_ta_search (COS.ta.626 034)	(1) NGC-1140	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=4; CENTER=BRIGHT EST			20 Secs (20 Secs) [==>]	[1]
	Comments: F(1400)~6.3e-14, IUE~5e-14, using 5e-15, extended source									
	2	ngc1140_ta_image (COS.ta.644 736)	(1) NGC-1140	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				182 Secs (182 Secs) [==>]	[1]
	3	ngc1140_tta_g (COS.sp.626 083)	(1) NGC-1140	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=ALL; BUFFER-TIME=50 0; EXTENDED=YES			21 Secs (84 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
	Comments: Buffer-time and ETC for one sub-exposure									
4	ngc1140_tta_g_h2 (COS.sp.626 097)	(1) NGC-1140	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=60 0; EXTENDED=YES			95 Secs (380 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]	
Comments: Buffer-time and ETC for one sub-exposure										



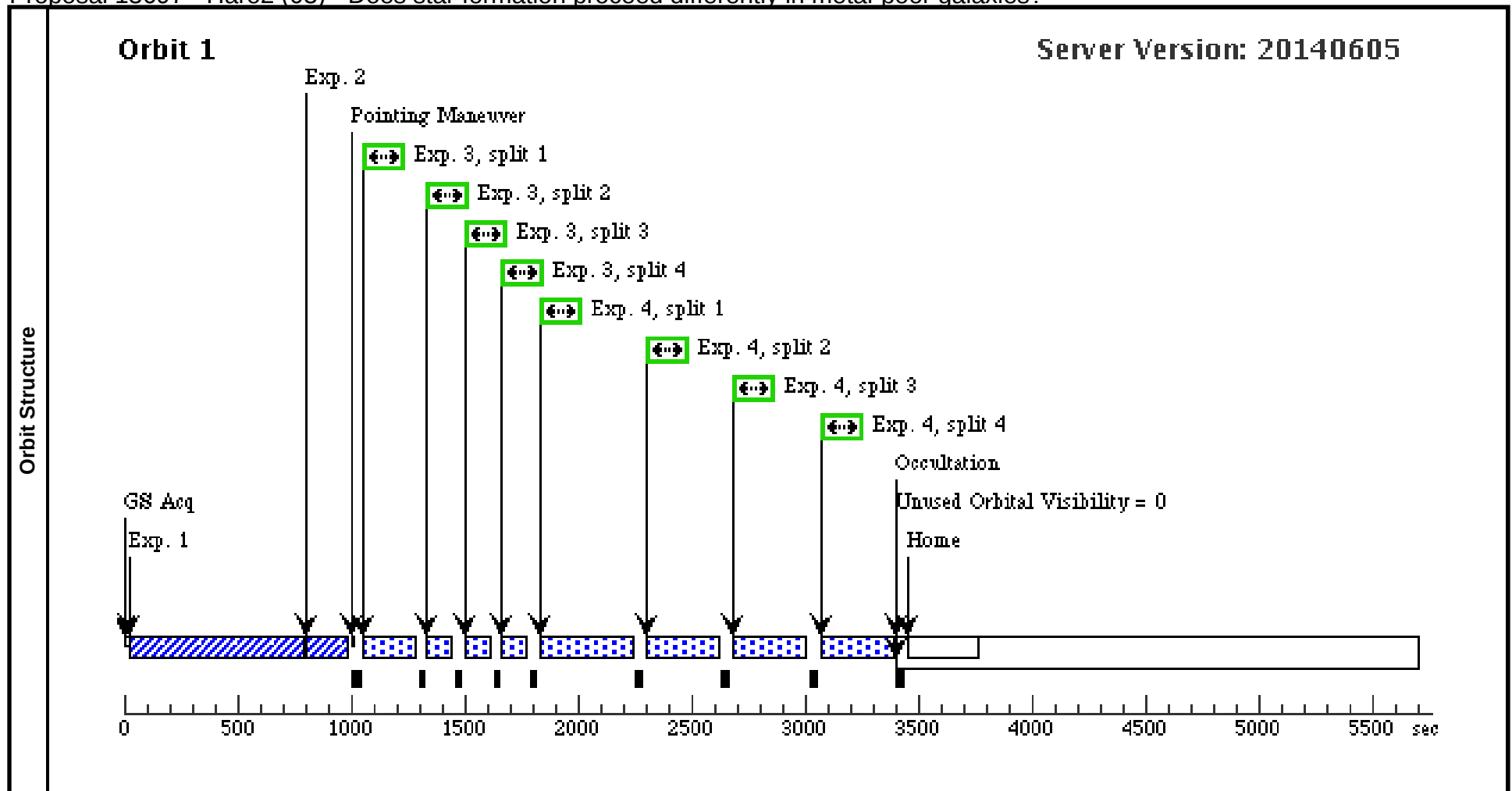
Proposal 13697 - He2-10 (02) - Does star formation proceed differently in metal-poor galaxies?

Visit	Proposal 13697, He2-10 (02), implementation								Tue Dec 02 02:01:23 GMT 2014	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: COS/NUV, COS/FUV									
	Special Requirements: (none)									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(2)	HE2-10	RA: 08 36 15.1100 (129.0629583d) Dec: -26 24 33.70 (-26.40936d) Equinox: J2000	Radial Velocity: 873 km/sec	V=12.5 GALEX_FUV=13.5, F(1400)~1.88e-13, N(CII*)~15.20	Reference Frame: ICRS				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	he2-10_ta_i mage (COS.ta.639 000)	(2) HE2-10	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				80 Secs (80 Secs) [==>]	 [1]
	Comments: F(1400)~1.88e-13, STIS G140L (52x0.2): 3e-15; IUE Large 8e-15) GALEX FUV = 13.5 using 5e-15 Source is neither point-source or extended, choosing exposure time in between									
	2	he2-10_ttag (COS.sp.626 102)	(2) HE2-10	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=ALL; BUFFER-TIME=28 54; EXTENDED=YES			50 Secs (200 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	 [1]
	Comments: Buffer-time and ETC for one sub-exposure									
	3	he2-10_ttag _h2 (COS.sp.626 103)	(2) HE2-10	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=49 63; EXTENDED=YES			345 Secs (1380 Secs) [==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	 [1]
Comments: Buffer-time and ETC for one sub-exposure										



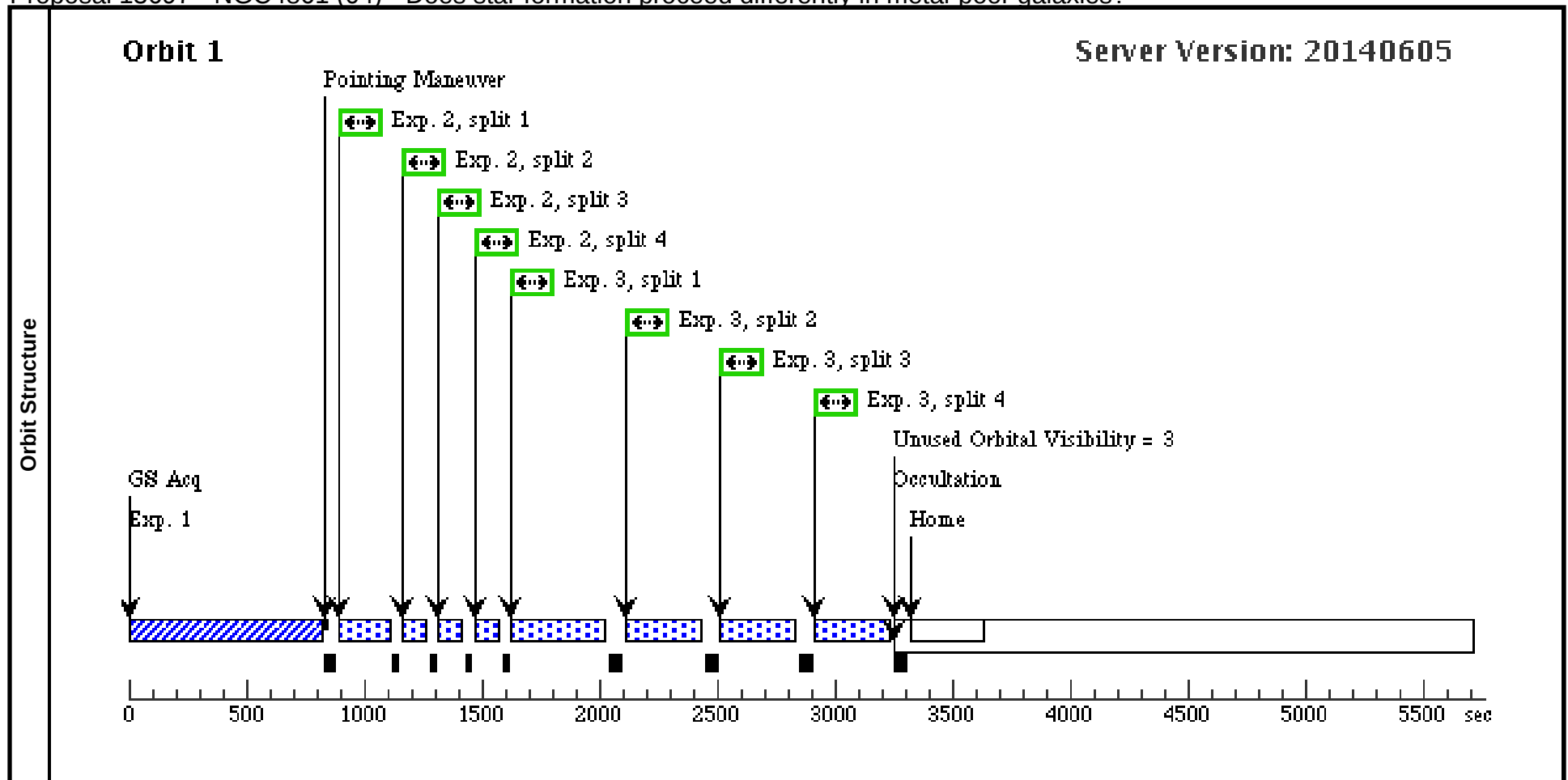
Proposal 13697 - Haro2 (03) - Does star formation proceed differently in metal-poor galaxies?

Visit	Proposal 13697, Haro2 (03), implementation								Tue Dec 02 02:01:23 GMT 2014	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: COS/NUV, COS/FUV									
	Special Requirements: (none)									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(3)	HARO2	RA: 10 32 32.0000 (158.1333333d) Dec: +54 24 2.80 (54.40078d) Equinox: J2000	Radial Velocity: 1430 km/sec	V=13.13 GALEX_FUV=15.1, F(1400)~4.31e-14, N(CII*)~14.7	Reference Frame: ICRS				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	haro2_ta_se arch (COS.ta.626 047)	(3) HARO2	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=3; CENTER=BRIGHT EST			20 Secs (20 Secs)	
									[==>]	[1]
	Comments: F(1400)~4.31e-14, COS G140L: 2.3e-14; STIS G140L 52x0.2: 2e-15, IUE Large: 5.5e-14 Using 3e-14 Neither extended or point-like in the FUV, taking exposure time between point-source and extended									
	2	haro2_ta_im age (COS.ta.626 048)	(3) HARO2	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				30 Secs (30 Secs)	
									[==>]	[1]
	3	haro2_ttag (COS.sp.626 106)	(3) HARO2	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=ALL; BUFFER-TIME=10 94; EXTENDED=YES			60 Secs (240 Secs)	
								[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]	
Comments: Buffer-time and ETC for one sub-exposure										
4	haro2_ttag_h2 (COS.sp.626 107)	(3) HARO2	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=14 18; EXTENDED=YES			270 Secs (1080 Secs)		
								[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]	
Comments: Buffer-time and ETC for one sub-exposure										



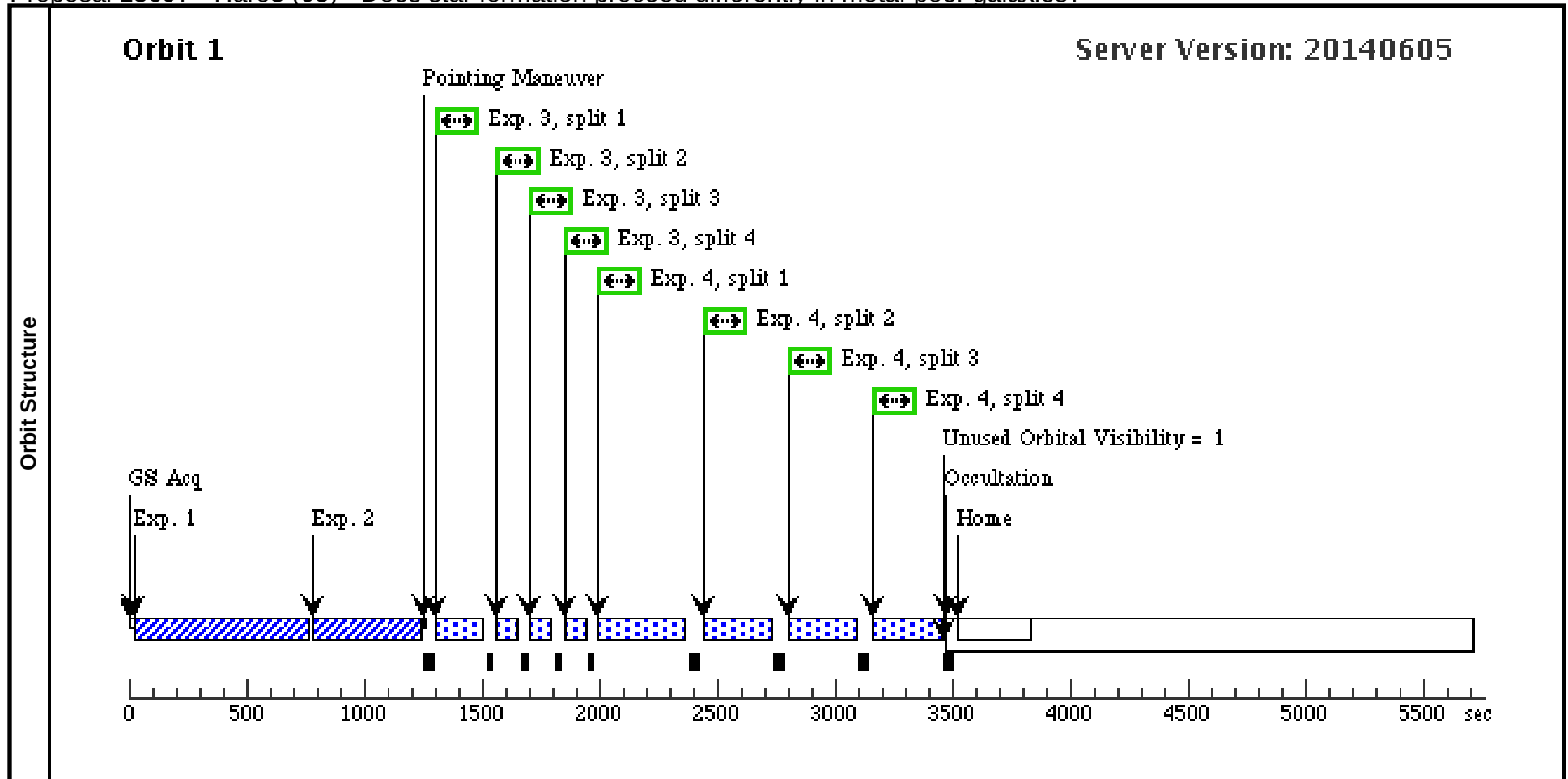
Proposal 13697 - NGC4861 (04) - Does star formation proceed differently in metal-poor galaxies?

Visit	Proposal 13697, NGC4861 (04), implementation								Tue Dec 02 02:01:23 GMT 2014	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: COS/NUV, COS/FUV									
	Special Requirements: (none)									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(4)	NGC-4861	RA: 12 59 0.2300 (194.7509583d) Dec: +34 50 43.50 (34.84542d) Equinox: J2000	Radial Velocity: 835 km/sec		V=12.32 GALEX_FUV=14.0, F(1400)~4.16e-14, N(CII*)~14.3		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ngc4861_ta_image (COS.ta.626 055)	(4) NGC-4861	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				200 Secs (200 Secs)	
									[==>]	[1]
	Comments: F(1400)~4.16e-14, HST STIS G140L: 6e-16; IUE Large: 1e-13 Using 1e-14 Neither extended or point-like in the FUV, taking exposure time between point-source and extended									
	2	ngc4861_tta_g (COS.sp.626 112)	(4) NGC-4861	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=ALL; BUFFER-TIME=60 0; EXTENDED=YES			50 Secs (200 Secs)	
									[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
	Comments: Buffer-time and ETC for one sub-exposure									
	3	ngc4861_tta_g_h2 (COS.sp.626 113)	(4) NGC-4861	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=80 0; EXTENDED=YES			268 Secs (1072 Secs)	
									[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
Comments: Buffer-time and ETC for one sub-exposure										



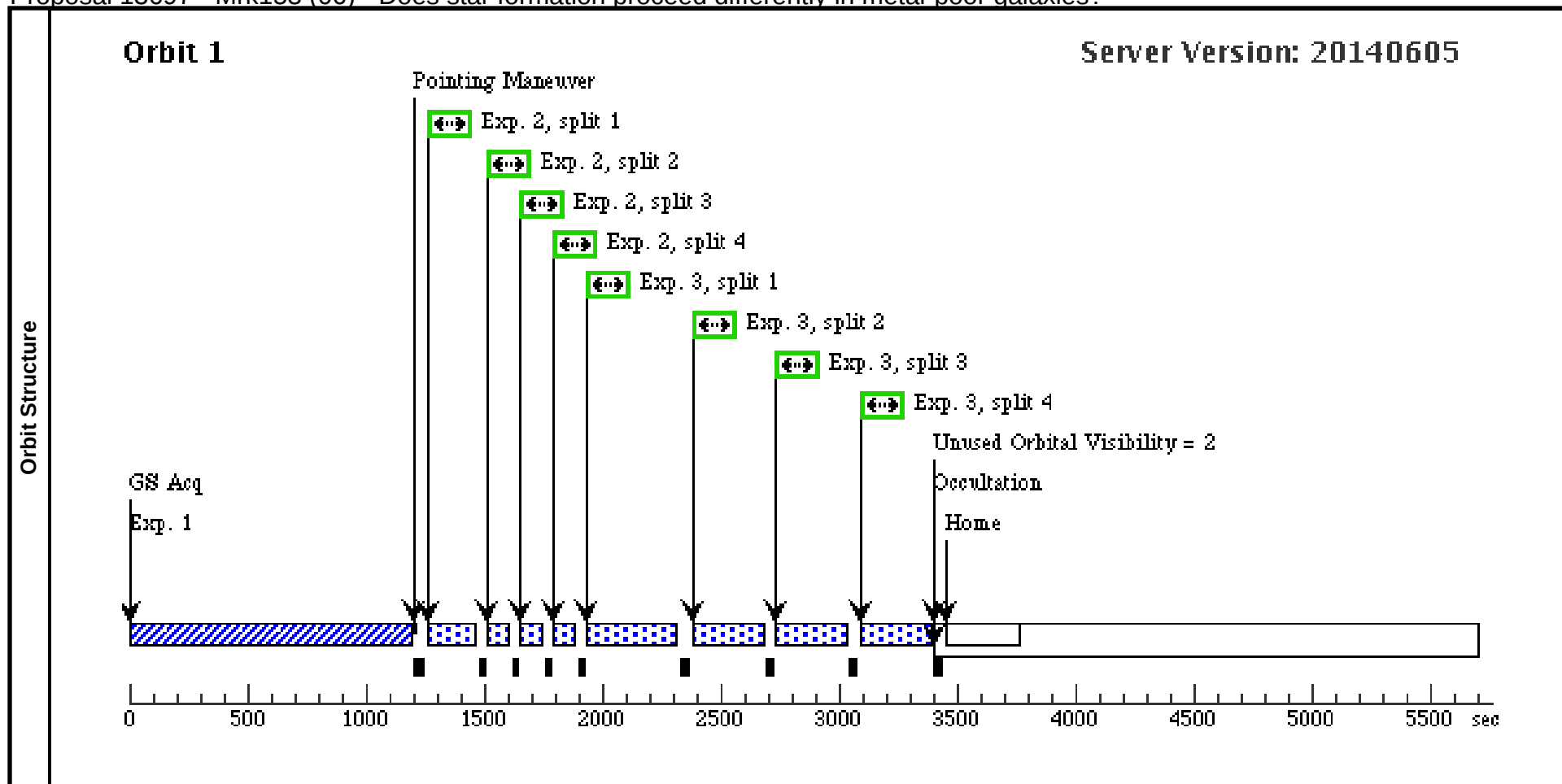
Proposal 13697 - Haro3 (05) - Does star formation proceed differently in metal-poor galaxies?

Visit	Proposal 13697, Haro3 (05), implementation								Tue Dec 02 02:01:23 GMT 2014	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: COS/NUV, COS/FUV									
	Special Requirements: (none)									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(5)	HARO3	RA: 10 45 22.0600 (161.3419167d) Dec: +55 57 39.80 (55.96106d) Equinox: J2000	Radial Velocity: 944 km/sec	V=12.79 GALEX_FUV=14.8, F(1400)~3.98e-14, N(CII*)~14.7	Reference Frame: ICRS				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	haro3_ta_se arch (COS.ta.626 063)	(5) HARO3	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=3; CENTER=BRIGHT EST			17 Secs (17 Secs)	
									[==>]	[1]
	Comments: F(1400)~3.98e-14, COS G140L: 3e-15 Estimating 5e-15 in the peak Extended									
	2	haro3_ta_im age (COS.ta.644 740)	(5) HARO3	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				168 Secs (168 Secs)	
									[==>]	[1]
	3	haro3_ttag (COS.sp.626 122)	(5) HARO3	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=ALL; BUFFER-TIME=70 0; EXTENDED=YES			38 Secs (152 Secs)	
								[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]	
Comments: Buffer-time and ETC for one sub-exposure										
4	haro3_ttag_h2 (COS.sp.626 124)	(5) HARO3	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=10 00; EXTENDED=YES			238 Secs (952 Secs)		
								[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]	
Comments: Buffer-time and ETC for one sub-exposure										



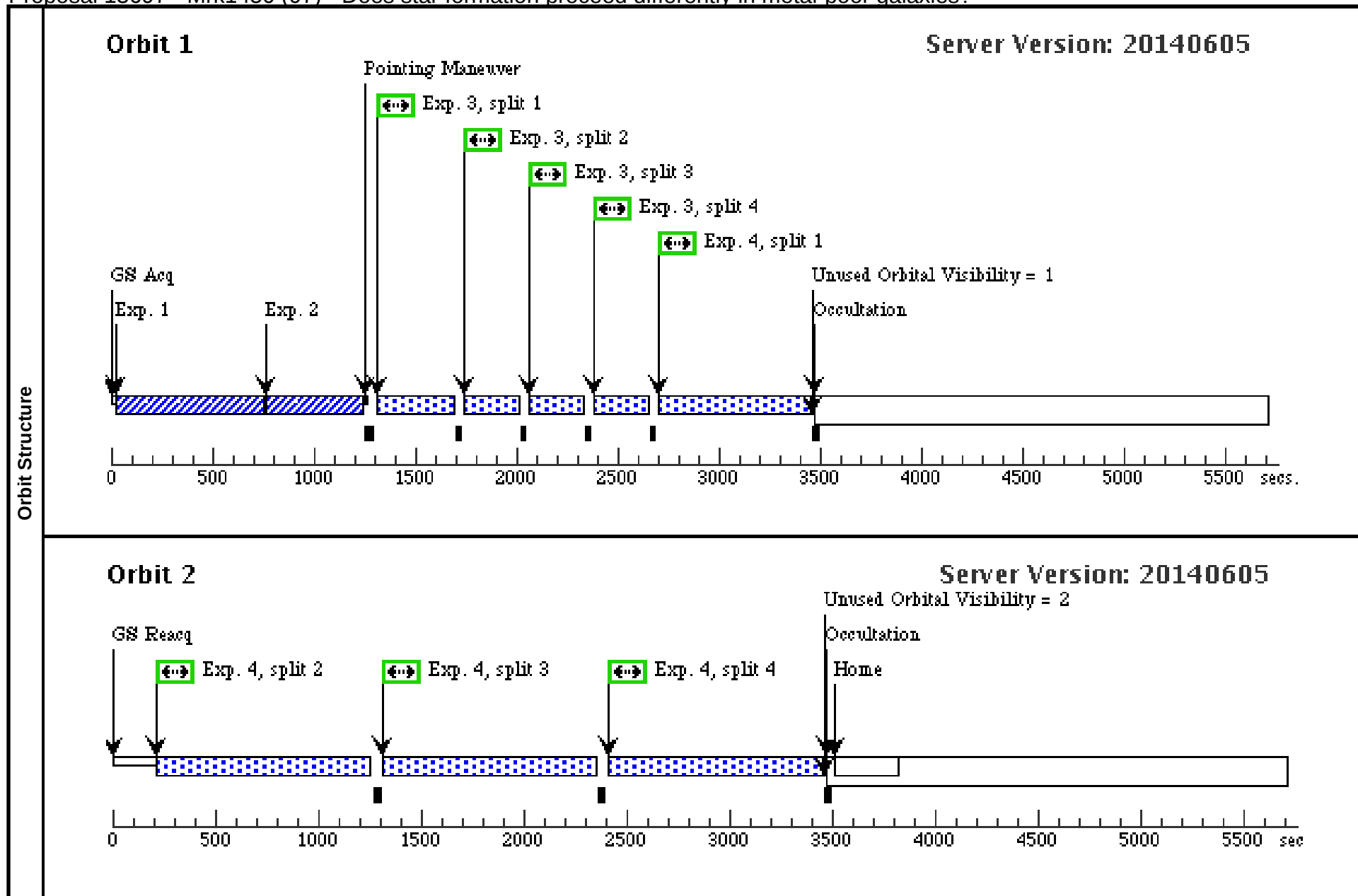
Proposal 13697 - Mrk153 (06) - Does star formation proceed differently in metal-poor galaxies?

Visit	Proposal 13697, Mrk153 (06), implementation								Tue Dec 02 02:01:23 GMT 2014	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: COS/NUV, COS/FUV									
	Special Requirements: (none)									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(6)	MRK-153	RA: 10 49 5.0300 (162.2709583d) Dec: +52 20 7.50 (52.33542d) Equinox: J2000	Radial Velocity: 2389 km/sec		V=14.81 GALEX_FUV=15.2, F(1400)~2.75e-14, N(CII*)~14.1		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	mrk153_ta_i mage (COS.ta.626 070)	(6) MRK-153	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				385 Secs (385 Secs)	
									[==>]	[1]
	Comments: F(1400)~2.75e-14, IUE Large: 3.6e-14; FUSE: 2.0e-14 Using 1e-14 Neither extended or point-like in the FUV, taking exposure time between point-source and extended									
	2	mrk153_ttag (COS.sp.626 126)	(6) MRK-153	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=ALL; BUFFER-TIME=10 00; EXTENDED=YES			35 Secs (140 Secs)	
									[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
Comments: Buffer-time and ETC for one sub-exposure										
	3	mrk153_ttag _h2 (COS.sp.626 128)	(6) MRK-153	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=15 00; EXTENDED=YES			243 Secs (972 Secs)	
									[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
Comments: Buffer-time and ETC for one sub-exposure										



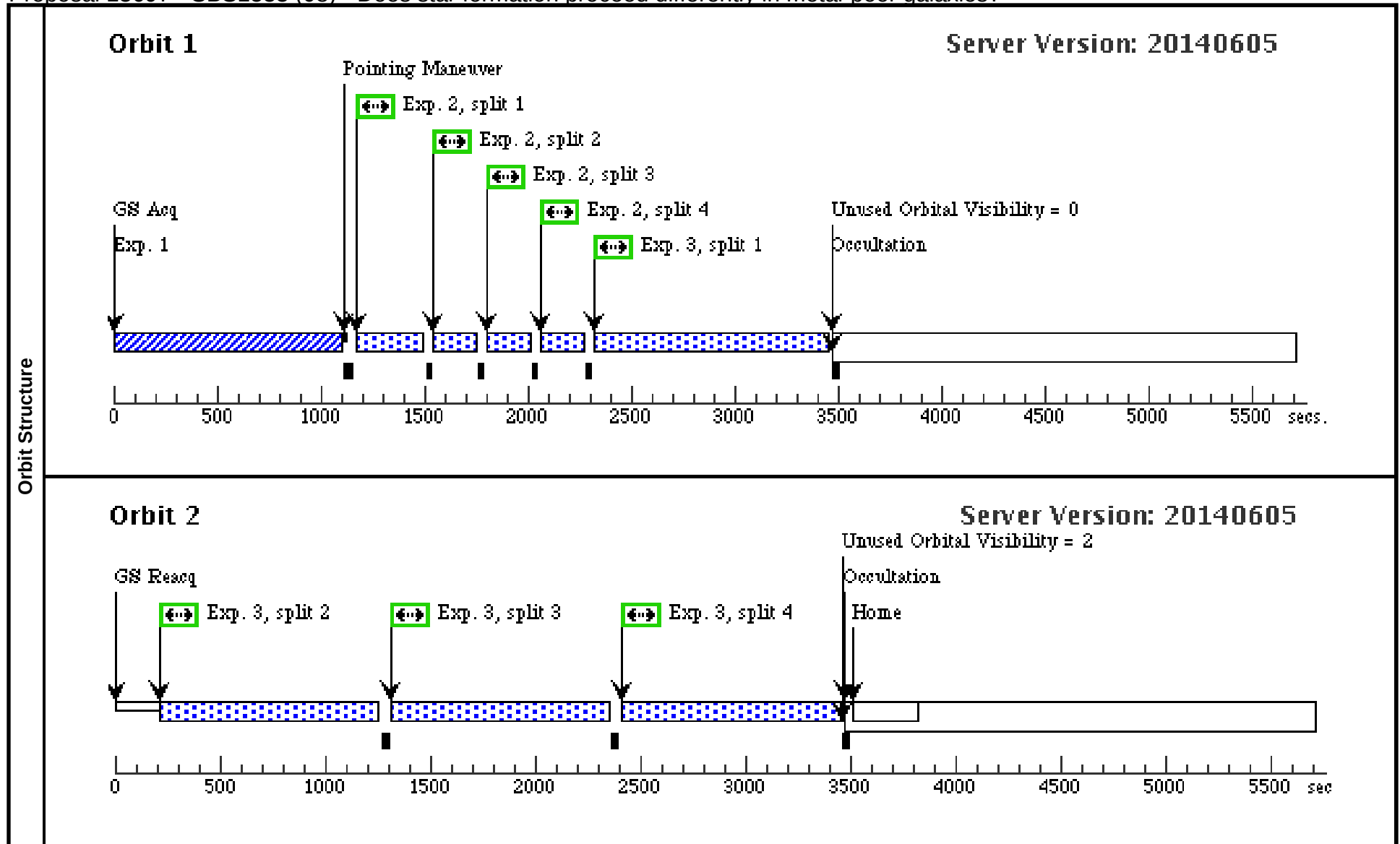
Proposal 13697 - Mrk1450 (07) - Does star formation proceed differently in metal-poor galaxies?

Visit	Proposal 13697, Mrk1450 (07), implementation								Tue Dec 02 02:01:24 GMT 2014	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: COS/NUV, COS/FUV									
	Special Requirements: (none)									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(7)	MRK-1450	RA: 11 38 35.7000 (174.6487500d) Dec: +57 52 27.00 (57.87417d) Equinox: J2000	Radial Velocity: 946 km/sec	V=14.5+/-0.5 GALEX_FUV=16.7, F(1400)=9.87e-15, N(CII*)~14.3	Reference Frame: ICRS				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	mrk1450_ta_search (COS.ta.644 742)	(7) MRK-1450	COS/NUV, ACQ/SEARCH, PSA	MIRRORB	SCAN-SIZE=3; CENTER=BRIGHT EST			15 Secs (15 Secs) [==>]	 [1]
	Comments: F(1400)=9.87e-15, FUSE: 8e-15 Using 5e-15 Neither extended or point-like in the FUV, taking exposure time between point-source and extended									
	2	mrk1450_ta_image (COS.ta.644 743)	(7) MRK-1450	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				180 Secs (180 Secs) [==>]	 [1]
	3	mrk1450_tta_g (COS.sp.626 130)	(7) MRK-1450	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=ALL; BUFFER-TIME=28 54; EXTENDED=YES			300 Secs (856 Secs) [==>214.0 Secs (Split 1)] [==>214.0 Secs (Split 2)] [==>214.0 Secs (Split 3)] [==>214.0 Secs (Split 4)]	 [1]
	Comments: Buffer-time and ETC for one sub-exposure									
	4	mrk1450_tta_g_h2 (COS.sp.626 132)	(7) MRK-1450	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=49 81; EXTENDED=YES			700 Secs (3566 Secs) [==>614.0 Secs (Split 1)] [==>984.0 Secs (Split 2)] [==>984.0 Secs (Split 3)] [==>984.0 Secs (Split 4)]	 [1] [2]
	Comments: Buffer-time and ETC for one sub-exposure									



Proposal 13697 - SBS1533 (08) - Does star formation proceed differently in metal-poor galaxies?

Visit	Proposal 13697, SBS1533 (08), implementation									Tue Dec 02 02:01:24 GMT 2014
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: COS/NUV, COS/FUV									
	Special Requirements: (none)									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(8)	SBS1533+574	RA: 15 34 14.1800 (233.5590833d) Dec: +57 17 3.40 (57.28428d) Equinox: J2000	Radial Velocity: 3310 km/sec		V=15.8+/-0.5 GALEX_FUV=16.9, F(1400)~5.75e-15, N(CII*)~14.3		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	sbs1533_ta_image (COS.ta.624 888)	(8) SBS1533+574	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				340 Secs (340 Secs)	
									[==>]	[1]
	Comments: F(1400)~5.75e-15, only GALEX Point-source									
	2	sbs1533_tta_g (COS.sp.626 133)	(8) SBS1533+574	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=ALL; BUFFER-TIME=27 26; EXTENDED=YES			130 Secs (616 Secs)	
									[==>154.0 Secs (Split 1)] [==>154.0 Secs (Split 2)] [==>154.0 Secs (Split 3)] [==>154.0 Secs (Split 4)]	[1]
	Comments: Buffer-time and ETC for one sub-exposure									
	3	sbs1533_tta_g_h2 (COS.sp.626 134)	(8) SBS1533+574	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=46 57; EXTENDED=YES			970 Secs (3946 Secs)	
									[==>994.0 Secs (Split 1)] [==>984.0 Secs (Split 2)] [==>984.0 Secs (Split 3)] [==>984.0 Secs (Split 4)]	[1] [2]
	Comments: Buffer-time and ETC for one sub-exposure									



Proposal 13697 - NGC1705 (09) - Does star formation proceed differently in metal-poor galaxies?

Visit	Proposal 13697, NGC1705 (09), implementation								Tue Dec 02 02:01:24 GMT 2014	
	Diagnostic Status: No Diagnostics									
	Scientific Instruments: COS/NUV, COS/FUV									
	Special Requirements: (none)									
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections		Fluxes		Miscellaneous		
	(9)	NGC-1705	RA: 04 54 13.4100 (73.5558750d) Dec: -53 21 38.87 (-53.36080d) Equinox: J2000	Radial Velocity: 633 km/sec		V=12.39 GALEX_FUV=13.6, F(1400)~1.20e-13, N(CII*)~14.5		Reference Frame: ICRS		
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
Exposures	#	Label (ETC Run)	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
	1	ngc1705_ta_image (COS.ta.626 079)	(9) NGC-1705	COS/NUV, ACQ/IMAGE, PSA	MIRRORB				8 Secs (8 Secs)	
									[==>]	[1]
	Comments: F(1400)~1.20e-13, 7.1e-14 Using 5e-14 Point-source									
	2	ngc1705_tta_g (COS.sp.626 140)	(9) NGC-1705	COS/FUV, TIME-TAG, PSA	G130M 1291 A	FP-POS=ALL; BUFFER-TIME=73 8; EXTENDED=YES			100 Secs (400 Secs)	
									[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]
	Comments: Buffer-time and ETC for one sub-exposure									
3	ngc1705_tta_g_h2 (COS.sp.626 139)	(9) NGC-1705	COS/FUV, TIME-TAG, PSA	G130M 1222 A	FP-POS=ALL; BUFFER-TIME=13 61; EXTENDED=YES			350 Secs (1400 Secs)		
								[==>(Split 1)] [==>(Split 2)] [==>(Split 3)] [==>(Split 4)]	[1]	
Comments: Buffer-time and ETC for one sub-exposure										

