



12449 - Atmospheric Composition of the ExoNeptune HAT-P-11

Cycle: 19, Proposal Category: GO

(Availability Mode: SUPPORTED)

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) HAT-P-11	WFC3/IR	4	21-Nov-2012 21:13:08.0	yes
02	(1) HAT-P-11	WFC3/IR	4	21-Nov-2012 21:20:39.0	yes

8 Total Orbits Used

ABSTRACT

We propose a joint Spitzer/HST program to observe transits of the exoNeptune planet HAT-P-11. From the wavelength dependence of the transit depths, we will infer the composition of this world's atmosphere. Our Spitzer photometry at both 3.6- and 4.5-microns will be sensitive to depletions or enhancements of methane such as recently reported for GJ436b. HST/WFC3 spectroscopy of water vapor at 1.4-microns will measure the oxygen abundance, a proxy for potential heavyelement enrichment of the planet. In addition to molecular composition, our suite of data will be sensitive to the presence of clouds and haze, similar to the recent Bean et al. observations of GJ1214b. Not only is HAT-P-11 key to understanding the unusual atmospheric compositions of small planets, but it also presents us with very favorable observational circumstances. It has the most massive atmosphere of any planet smaller than the gas giants, and it lies in the Kepler field. Highcadence photometry from Kepler will be acquired

simultaneously with our Spitzer and HST observations. The Kepler data will not only provide an exquisitely precise optical radius, but will also allow us to model and remove the effect of star spots from our HST and Spitzer data.

OBSERVING DESCRIPTION

WFC3 grism spectroscopy of HAT-P-11

Proposal 12449 - Visit 01 - Atmospheric Composition of the ExoNeptune HAT-P-11

Visit	Proposal 12449, Visit 01, completed Diagnostic Status: Warning Scientific Instruments: WFC3/IR Special Requirements: Period 4.887804 D AND ZERO-PHASE HJD2454605.89132 <i>Comments: first transit</i>					Thu Nov 22 02:21:16 GMT 2012
	(Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN (Visit 01) Warning (Orbit Planner): VISIBILITY OVERRUN					
Fixed Targets	Diagnostics					
	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HAT-P-11	RA: 19 50 50.1400 (297.7089167d) Dec: +48 04 49.00 (48.08028d) Equinox: J2000	Proper Motion RA: 127.2 mas/yr Proper Motion Dec: 231.2 mas/yr Epoch of Position: 2000.0	V=9.473	Reference Frame: ICRS
	<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>					

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Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) HAT-P-11	WFC3/IR, MULTIACCUM, IRSUB256	F139M	SAMP-SEQ=RAPID ; NSAMP=6	POS TARG 0.0,0.0; PHASE 0.967 TO 0. 971		[==>]	
										[1]

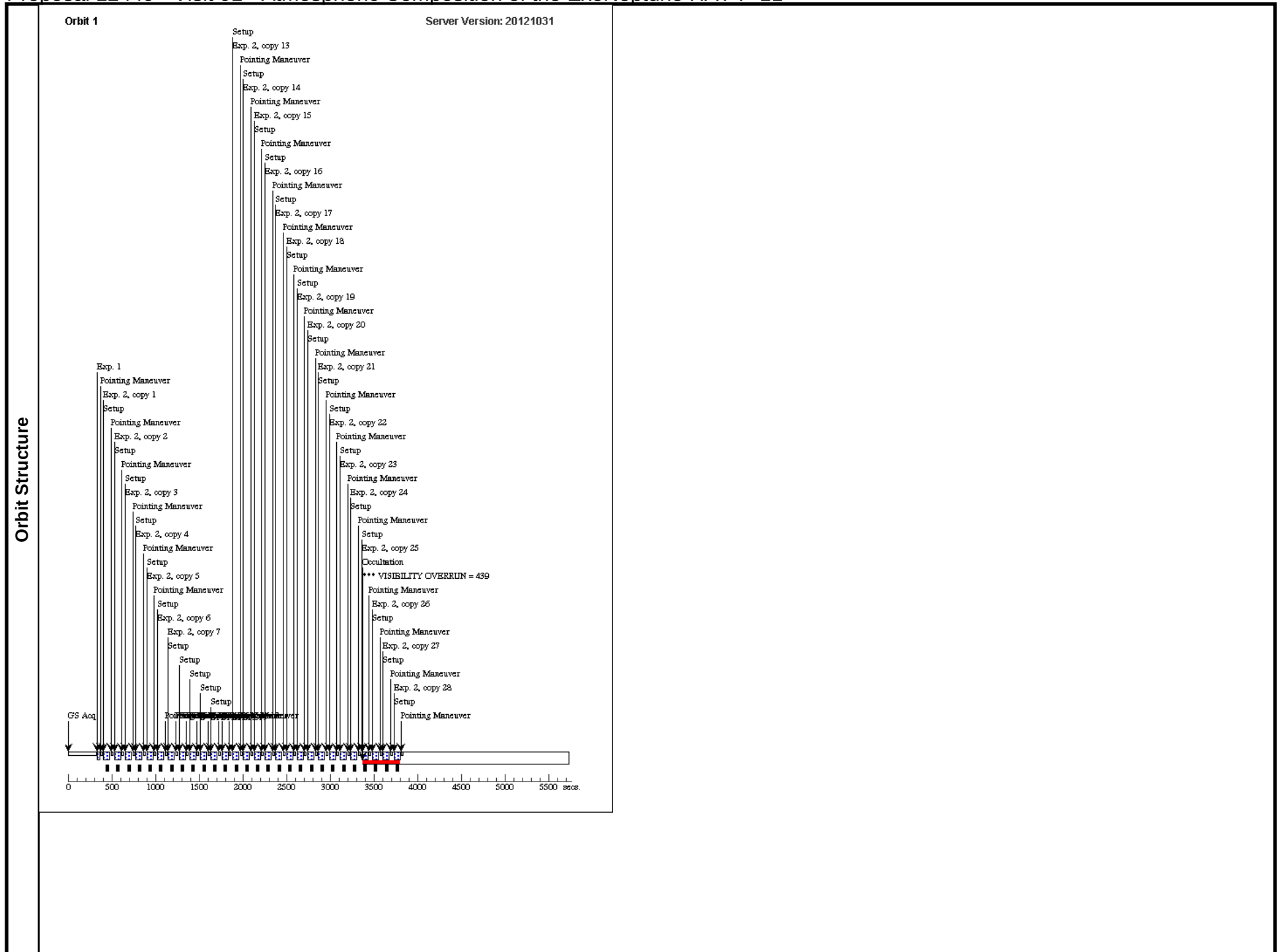
Proposal 12449 - Visit 01 - Atmospheric Composition of the ExoNeptune HAT-P-11

2	(1) HAT-P-11	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=7	POS TARG 0.0,-9.3; SPATIAL SCAN 0.3 7,90.0 Degrees,Forward	[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)] [==>(Copy 20)] [==>(Copy 21)] [==>(Copy 22)] [==>(Copy 23)] [==>(Copy 24)] [==>(Copy 25)] [==>(Copy 26)] [==>(Copy 27)] [==>(Copy 28)]	[1]
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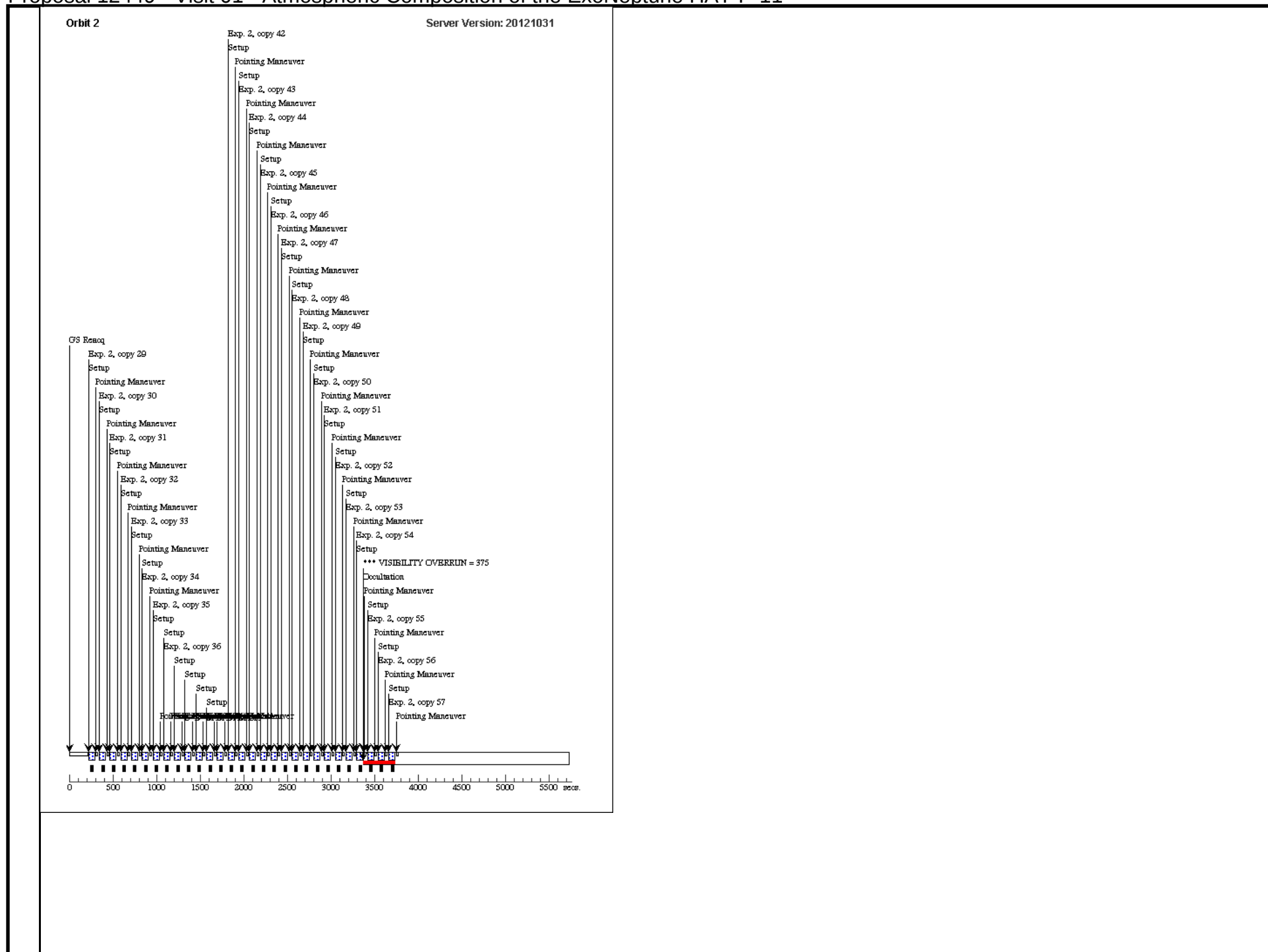
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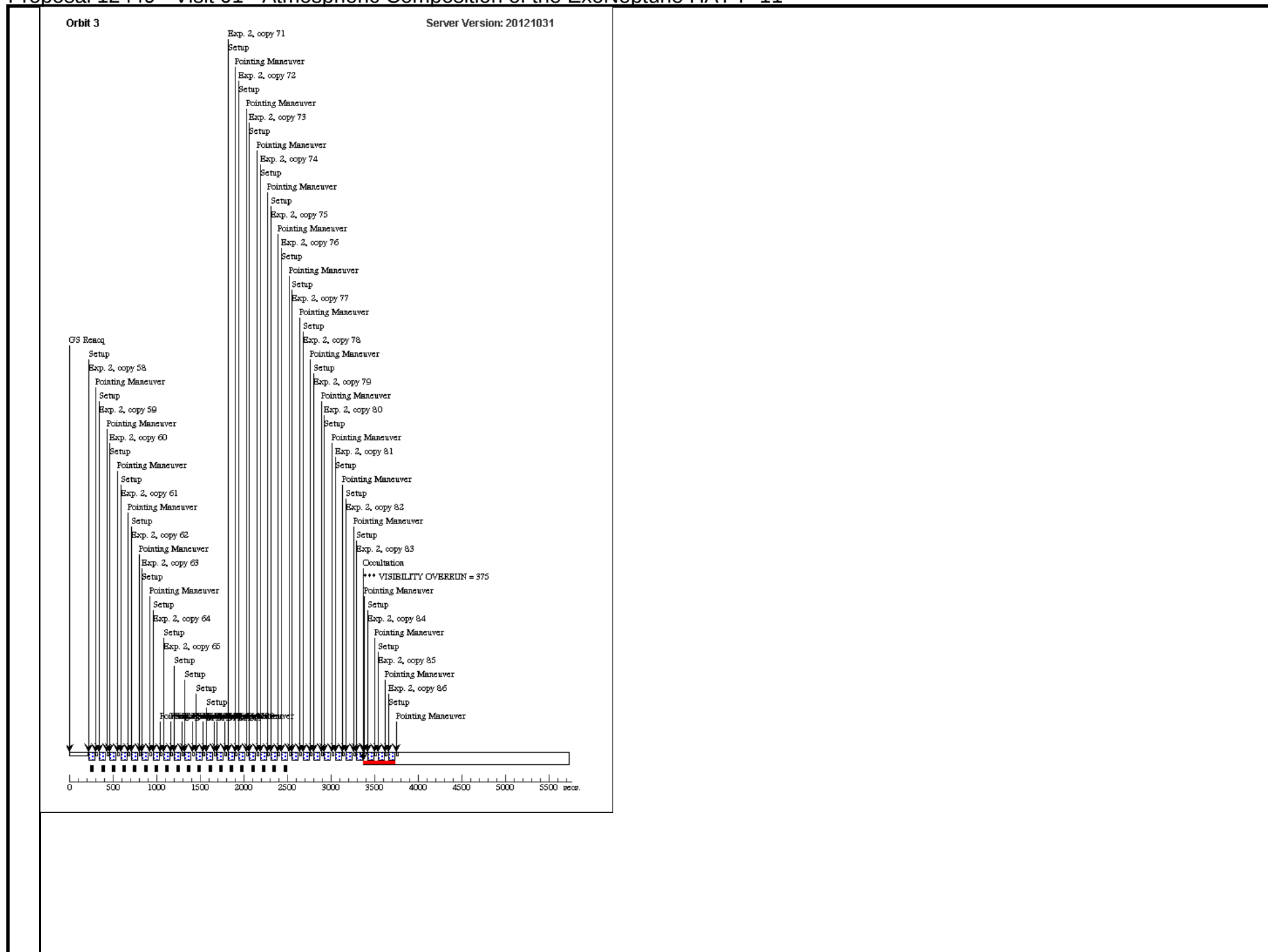
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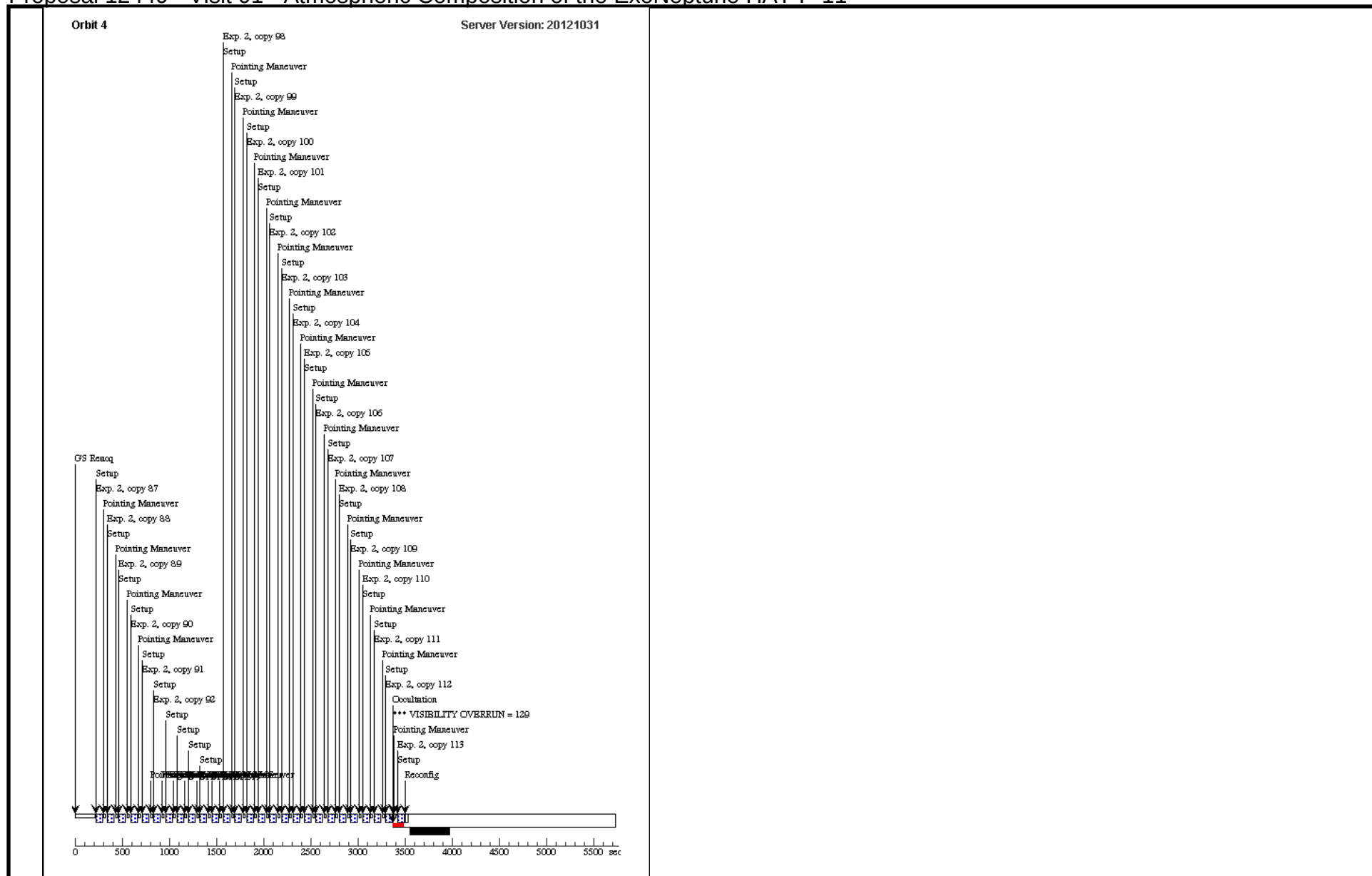


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Proposal 12449 - Visit 02 - Atmospheric Composition of the ExoNeptune HAT-P-11

Visit	Proposal 12449, Visit 02, implementation Diagnostic Status: No Diagnostics Scientific Instruments: WFC3/IR Special Requirements: Period 4.887804 D AND ZERO-PHASE HJD2454605.89132 <i>Comments: second transit</i>					Thu Nov 22 02:21:30 GMT 2012
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(1)	HAT-P-11	RA: 19 50 50.1400 (297.7089167d) Dec: +48 04 49.00 (48.08028d) Equinox: J2000	Proper Motion RA: 127.2 mas/yr Proper Motion Dec: 231.2 mas/yr Epoch of Position: 2000.0	V=9.473	Reference Frame: ICRS
<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i>						

Proposal 12449 - Visit 02 - Atmospheric Composition of the ExoNeptune HAT-P-11

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) HAT-P-11	WFC3/IR, MULTIACCUM, IRSUB256	F139M	SAMP-SEQ=RAPID ; NSAMP=6	POS TARG 0.0,0.0; PHASE 0.962 TO 0. 966		[==>]	
										[1]

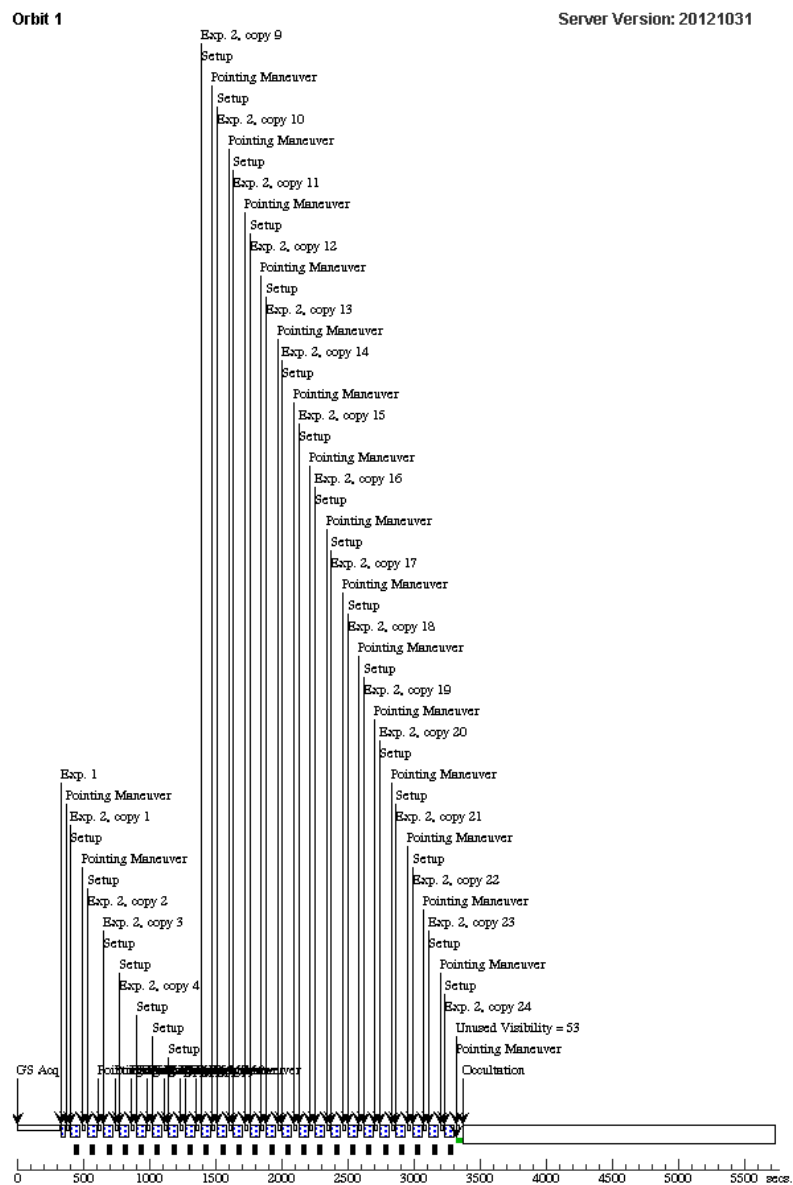
Proposal 12449 - Visit 02 - Atmospheric Composition of the ExoNeptune HAT-P-11

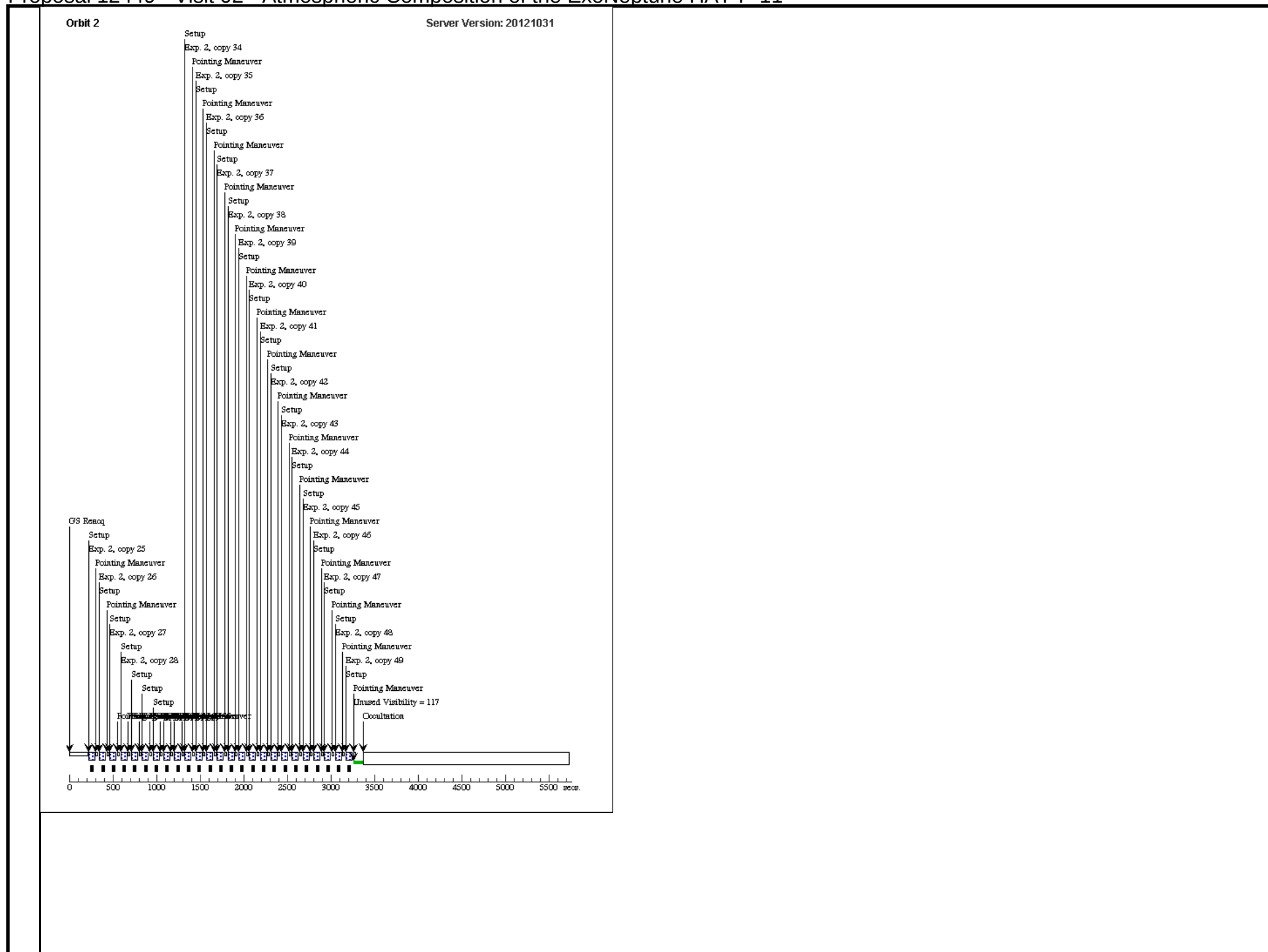
2	(1) HAT-P-11	WFC3/IR, MULTIACCUM, GRISM256	G141	SAMP-SEQ=SPARS 10; NSAMP=7	POS TARG 0.0,-9.3; SPATIAL SCAN 0.3 7,90.0 Degrees,Forward	[==>(Copy 1)] [==>(Copy 2)] [==>(Copy 3)] [==>(Copy 4)] [==>(Copy 5)] [==>(Copy 6)] [==>(Copy 7)] [==>(Copy 8)] [==>(Copy 9)] [==>(Copy 10)] [==>(Copy 11)] [==>(Copy 12)] [==>(Copy 13)] [==>(Copy 14)] [==>(Copy 15)] [==>(Copy 16)] [==>(Copy 17)] [==>(Copy 18)] [==>(Copy 19)] [==>(Copy 20)] [==>(Copy 21)] [==>(Copy 22)] [==>(Copy 23)] [==>(Copy 24)]	[1]
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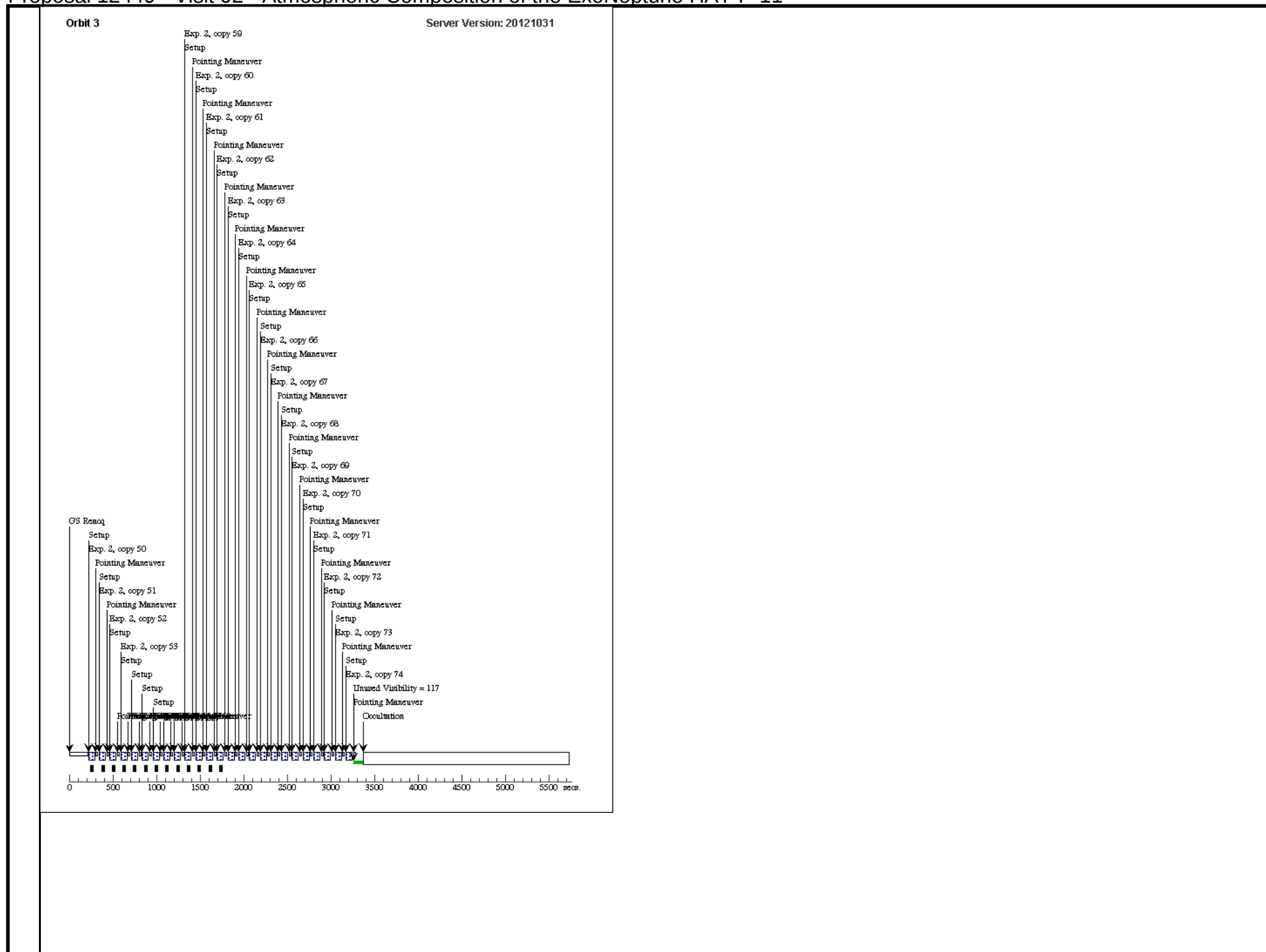
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Proposal 12449 - Visit 02 - Atmospheric Composition of the ExoNeptune HAT-P-11

