17399 - Astrometric signature of a Second Planet in Proxima

Cycle: 31, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

Name	*Institution*
Dr. Luigi R. Bedin (PI) (ESA Member) (Contact)	**INAF - Osservatorio Astronomico di Padova**
Prof. Adam J. Burgasser (CoI) (AdminUSPI)	University of California - San Diego
Dr. Mattia Libralato (CoI) (ESA Member)	INAF - Istituto di Astrofisica Spaziale

VISITS

Visit	*Targets used in Visit*	*Configurations used in Visit*	*Orbits Used*	*Last Orbit Planner Run*	*OP Current with Visit?*
01	(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS	1	13-Jun-2024 17:00:15.0	yes
02	(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS	1	13-Jun-2024 17:00:16.0	yes

2 Total Orbits Used

ABSTRACT

Proxima Centauri is the closest star to the Sun and the closest known exo-planetary system to Earth. It is therefore a key benchmark for detailed investigations of multi-planet system architecture, particularly for low mass stars. Recent ground-based radial velocity campaigns indicate the presence of at least one --and possibly a second-- exo-planet orbiting Proxima Centauri.

To test the multi-planet configuration of this system, we propose to use HST in spatial-scanning mode to obtain the most precise relative astrometry for Proxima Centauri to date (~20 micro-arc-seconds). The proposed sequence of six (6) epochs of observations over three (3) years will unambiguously detect the astrometric perturbation of Proxima Centauri induced by the hypothesized planet c, and constrain that planet's orbital geometry and mass.

OBSERVING DESCRIPTION

Observing Proxima Centauri

Visit

Proposal 17399, Visit 01, implementation Thu Jun 13 21:00:17 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 80D TO 90 D; BETWEEN 06-JUL-2024 AND 26-SEP-2024

Comments: first epoch must be taken as early as possible during Cy29

Fixed Targets

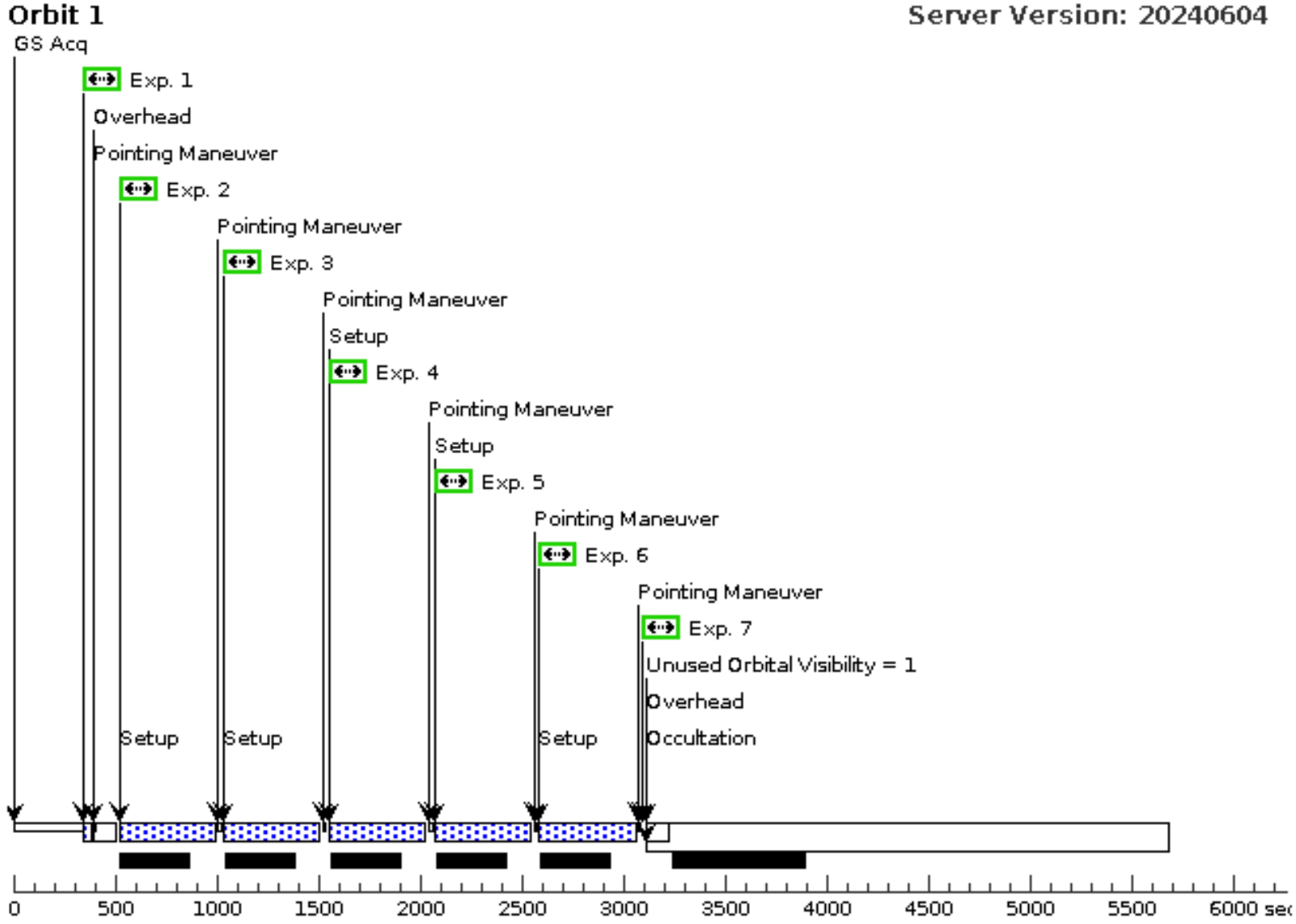
#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	PROXIMA-CENTAURI-TIME	RA: 14 29 29.0000 (217.3708333d) Dec: -62 40 25.00 (-62.67361d) Equinox: J2000		V=11.13	Reference Frame: SIMBAD

Comments:
Category=STAR
Description=[LOW MASS COMPANION, M V-IV]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS1-FIX	F467M	FLASH=16	POS TARG -4,-4		5 Secs (5 Secs) *[==>]*	 ***[1]***
2		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS1	F467M	FLASH=16	POS TARG -4,-4; SPATIAL SCAN 0.2 128,270.0 Degrees,Forward,1.25 Arcsec,6		348 Secs (348 Secs) *[==>]*	 ***[1]***
3		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS1	F467M	FLASH=16	POS TARG -4,4; SPATIAL SCAN 0.2 128,0.0 Degrees,Forward,1.25 Arcsec,6		348 Secs (348 Secs) *[==>]*	 ***[1]***
4		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS1	F467M	FLASH=16	POS TARG 0,0; SPATIAL SCAN 0.2 128,270.0 Degrees,Forward,1.25 Arcsec,6		348 Secs (348 Secs) *[==>]*	 ***[1]***
5		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS1	F467M	FLASH=16	POS TARG 4,-4; SPATIAL SCAN 0.2 128,180.0 Degrees,Forward,1.25 Arcsec,6		348 Secs (348 Secs) *[==>]*	 ***[1]***
6		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS1	F467M	FLASH=16	POS TARG 4,4; SPATIAL SCAN 0.2 128,90.0 Degrees,Forward,1.25 Arcsec,6		350 Secs (350 Secs) *[==>]*	 ***[1]***
7		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS1	F467M	FLASH=16	POS TARG 4,4		5 Secs (5 Secs) *[==>]*	 ***[1]***

Orbit Structure



Visit

Proposal 17399, Visit 02, implementation Thu Jun 13 21:00:17 GMT 2024

Diagnostic Status: No Diagnostics

Scientific Instruments: WFC3/UVIS

Special Requirements: ORIENT 275D TO 327 D; BETWEEN 19-FEB-2025 AND 22-MAR-2025

Comments: first epoch must be taken as early as possible during Cy29

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
(1)	PROXIMA-CENTAURI-TIME	RA: 14 29 29.0000 (217.3708333d) Dec: -62 40 25.00 (-62.67361d) Equinox: J2000		V=11.13	Reference Frame: SIMBAD

Comments:
Category=STAR
Description=[LOW MASS COMPANION, M V-IV]

Exposures

#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time (Total)/[Actual Dur.]	Orbit
1		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS2-FIX	F467M	FLASH=16	POS TARG -4,-4		5 Secs (5 Secs) *[==>]*	 ***[1]***
2		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS2-FIX	F467M	FLASH=16	POS TARG -4,-4; SPATIAL SCAN 0.2 128,270.0 Degrees,Forward,1.25 Arcsec,6		348 Secs (348 Secs) *[==>]*	 ***[1]***
3		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS2-FIX	F467M	FLASH=16	POS TARG -4,4; SPATIAL SCAN 0.2 128,0.0 Degrees,Forward,1.25 Arcsec,6		348 Secs (348 Secs) *[==>]*	 ***[1]***
4		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS2-FIX	F467M	FLASH=16	POS TARG 0,0; SPATIAL SCAN 0.2 128,270.0 Degrees,Forward,1.25 Arcsec,6		348 Secs (348 Secs) *[==>]*	 ***[1]***
5		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS2-FIX	F467M	FLASH=16	POS TARG 4,-4; SPATIAL SCAN 0.2 128,180.0 Degrees,Forward,1.25 Arcsec,6		348 Secs (348 Secs) *[==>]*	 ***[1]***
6		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS2-FIX	F467M	FLASH=16	POS TARG 4,4; SPATIAL SCAN 0.2 128,90.0 Degrees,Forward,1.25 Arcsec,6		350 Secs (350 Secs) *[==>]*	 ***[1]***
7		(1) PROXIMA-CENTAURI-TIME	WFC3/UVIS, ACCUM, UVIS2-FIX	F467M	FLASH=16	POS TARG 4,4		5 Secs (5 Secs) *[==>]*	 ***[1]***

Orbit Structure