



11784 - The orbit of the most massive known astrometric binary

Cycle: 17, 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) HD93129A	STIS/CCD	1	17-Nov-2009 21:03:15.0	yes
51	(1) HD93129A	STIS/CCD	1	17-Nov-2009 21:03:30.0	yes

2 Total Orbits Used

ABSTRACT

We have recently used FGS and HRC observations to (a) resolve HD 93129A into two components with very similar optical/UV colors and a magnitude difference of 0.9 and to (b) detect their relative orbital motion over a span of 8 years. HD 93129Aa is the prototype O2 If* star, with an evolutionary mass near 100 M_{Sun}, while Ab is likely to be a very early O main-sequence star with a similar or only slightly smaller mass. Our HST

astrometric measurements yield a total mass above $100 M_{\text{Sun}}$, thus confirming the extremely high mass of the binary, and indicate that the system appears to be approaching periastron. We request new FGS and HRC observations to (a) calculate the mass ratio of the system by measuring the orbit of each of the components with respect to the nearby stars, (b) obtain the periastron epoch, and (c) start measuring the orbit in order to produce an estimate of the total mass. These measurements are crucial to shed light on the value of the stellar upper mass limit. Due to the non-recovery of HRC on SM4, the last visit was changed to STIS.

OBSERVING DESCRIPTION

We propose observing HD 93129 at three different epochs using ACS/HRC and FGS. Due to the non-recovery of HRC on SM4, the last visit was changed to STIS.

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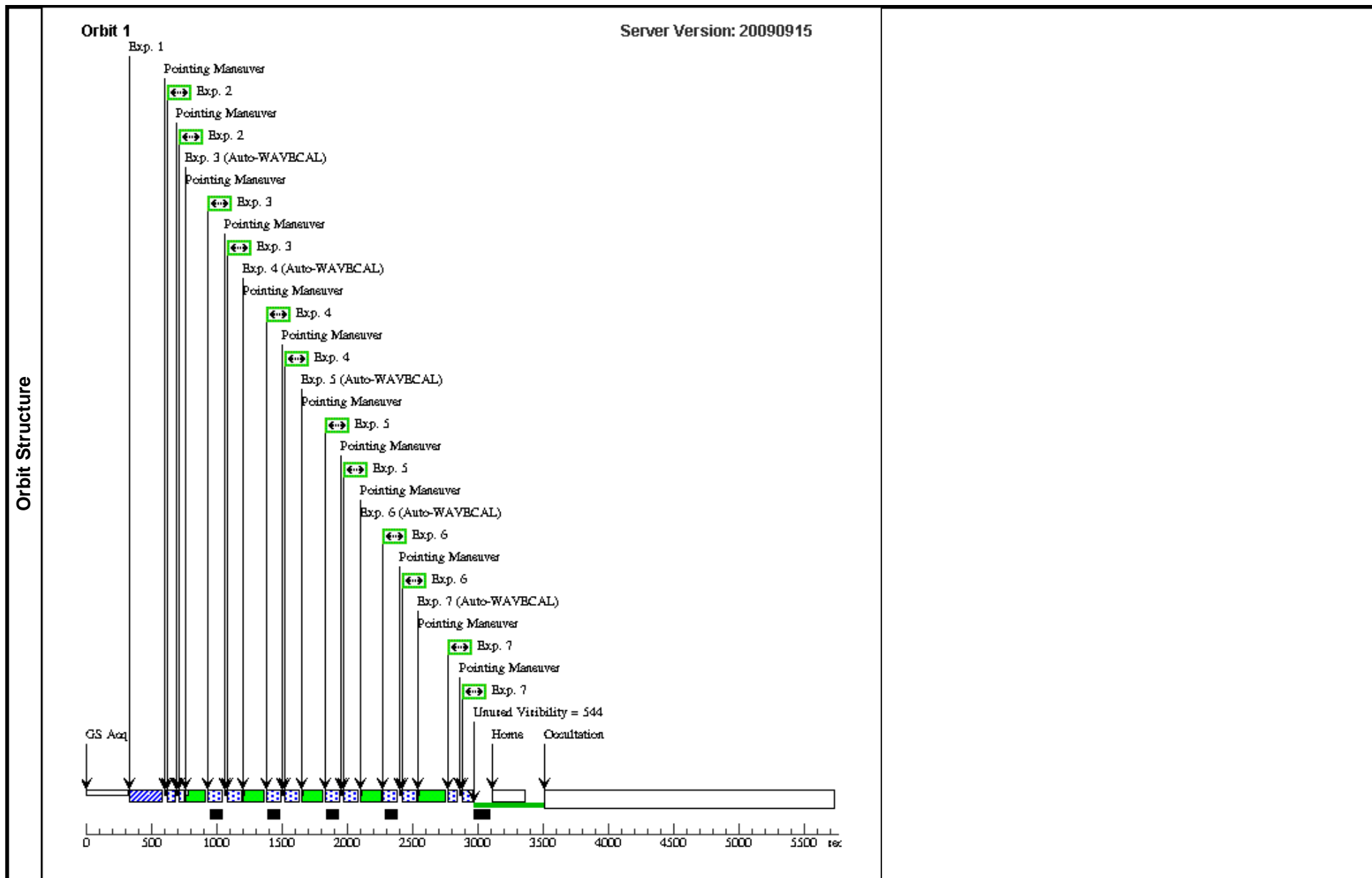
Wed Nov 18 02:03:35 GMT 2009

Visit	Proposal 11784, Visit 01, failed Diagnostic Status: No Diagnostics Scientific Instruments: STIS/CCD Special Requirements: ORIENT 59D TO 59 D; ORIENT 239D TO 239 D; BEFORE 01-JUN-2010:00:00:00									
	Patterns	#	Primary Pattern	Secondary Pattern	Exposures					
		(1)	Pattern Type=STIS-ALONG-SLIT Purpose=DITHER Number Of Points=2 Point Spacing=0.025 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides= Center Pattern=false		(3), (4), (5), (6), (7)				
	(2)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.035 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45 Angle Between Sides= Center Pattern=false		(2)					
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	HD93129A	RA: 10 43 57.4620 (160.9894250d) Dec: -59 32 51.27 (-59.54757d) Equinox: J2000		V=7.3+/-0.1 O2 If*	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) HD93129A	STIS/CCD, ACQ, F28X500II	MIRROR			GS ACQ SCENARI O BASE1B3		0.2 Secs [=>]	[1]
	2	(1) HD93129A	STIS/CCD, ACCUM, F28X500III	MIRROR		CR-SPLIT=NO; GAIN=4		Pattern 2, Exps 2-2 (2)	2 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	3	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G430M 4706 A		CR-SPLIT=NO; GAIN=4		Pattern 1, Exps 3-3 (1)	74 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	4	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G430M 4451 A		CR-SPLIT=NO; GAIN=4		Pattern 1, Exps 4-4 (1)	74 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	5	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G430M 4194 A		CR-SPLIT=NO; GAIN=4		Pattern 1, Exps 5-5 (1)	74 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	6	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G430M 3936 A		CR-SPLIT=NO; GAIN=4		Pattern 1, Exps 6-6 (1)	74 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]

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Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	7	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=NO; GAIN=4	Pattern 1, Exps 7-7 (1)	38 Secs [==>(Pattern 1)] [==>(Pattern 2)]			[1]

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Proposal 11784 - Visit 51 - The orbit of the most massive known astrometric binary

Wed Nov 18 02:03:36 GMT 2009

Visit	Proposal 11784, Visit 51, implementation Diagnostic Status: No Diagnostics Scientific Instruments: STIS/CCD Special Requirements: ORIENT 59D TO 59 D; ORIENT 239D TO 239 D; BEFORE 01-JUN-2010:00:00:00									
	Patterns	#	Primary Pattern			Secondary Pattern			Exposures	
		(1)	Pattern Type=STIS-ALONG-SLIT Purpose=DITHER Number Of Points=2 Point Spacing=0.025 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=90.0 Angle Between Sides= Center Pattern=false					(3), (4), (5), (6), (7)	
	(2)	Pattern Type=LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.035 Line Spacing=	Coordinate Frame=POS-TARG Pattern Orientation=45 Angle Between Sides= Center Pattern=false					(2)		
Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous				
	(1)	HD93129A	RA: 10 43 57.4620 (160.9894250d) Dec: -59 32 51.27 (-59.54757d) Equinox: J2000		V=7.3+/-0.1 O2 If*	Reference Frame: ICRS				
Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1	(1) HD93129A	STIS/CCD, ACQ, F28X500II	MIRROR			GS ACQ SCENARI O BASE1B3		0.2 Secs [=>]	[1]
	2	(1) HD93129A	STIS/CCD, ACCUM, F28X500III	MIRROR		CR-SPLIT=NO; GAIN=4		Pattern 2, Exps 2-2 (2)	2 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	3	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G430M 4706 A		CR-SPLIT=NO; GAIN=4		Pattern 1, Exps 3-3 (1)	74 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	4	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G430M 4451 A		CR-SPLIT=NO; GAIN=4		Pattern 1, Exps 4-4 (1)	74 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	5	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G430M 4194 A		CR-SPLIT=NO; GAIN=4		Pattern 1, Exps 5-5 (1)	74 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]
	6	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G430M 3936 A		CR-SPLIT=NO; GAIN=4		Pattern 1, Exps 6-6 (1)	74 Secs [=>(Pattern 1)] [=>(Pattern 2)]	[1]

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Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	7	(1) HD93129A	STIS/CCD, ACCUM, 52X0.2E1	G750M 6768 A	CR-SPLIT=NO; GAIN=4	Pattern 1, Exps 7-7 (1)	38 Secs [==>(Pattern 1)] [==>(Pattern 2)]		[1]	

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