



11294 - The orbit of the most massive known astrometric binary

Cycle: 16, 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>
02	(1) HD93129A (2) REF1 (3) REF2 (4) REF3 (5) REF4 (6) REF5 (7) REF6 (8) REF7 (9) REF8	FGS	1	21-May-2007 17:32:41.0	yes

1 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 1.3 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_{Sun} , thus confirming the extremely high mass of the binary, and indicate that the system appears to be approaching periastron. We request new FGS 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.

OBSERVING DESCRIPTION

We propose observing HD 93129 at three different epochs using ACS/HRC and FGS.

Proposal 11294 - Visit 02 - The orbit of the most massive known astrometric binary

Mon May 21 21:32:45 GMT 2007

Visit	Proposal 11294, Visit 02, implementation Diagnostic Status: Warning Scientific Instruments: FGS Special Requirements: PCS MODE FINE; SCHED 70%; ORIENT 144.0D TO 145.0 D; BETWEEN 01-JUL-2007:00:00:00 AND 31-AUG-2007:00:00:00																																														
Diagnostics	(Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: LONG FGS SCAN LENGTH MAY SIGNAL PROBLEMS (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA (Visit 02) Warning: FGS EXPOSURE TOO SHORT TO GUARANTEE SCIENCE DATA																																														
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>HD93129A</td> <td>RA: 10 43 57.5000 (160.9895833d) Dec: -59 32 53.00 (-59.54806d) Equinox: J2000</td> <td></td> <td>V=7.3+/-0.1 O2 If*</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td>(2)</td> <td>REF1 Alt Name1: GS8626-01835</td> <td>RA: 10 43 57.3000 (160.9887500d) Dec: -59 32 8.40 (-59.53567d) Equinox: J2000</td> <td></td> <td>V=12.8+/-0.2</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td>(3)</td> <td>REF2 Alt Name1: GS8626-02625</td> <td>RA: 10 43 56.2600 (160.9844167d) Dec: -59 32 28.20 (-59.54117d) Equinox: J2000</td> <td></td> <td>V=13.34+/-0.2</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td>(4)</td> <td>REF3 Alt Name1: GS86260-1570</td> <td>RA: 10 44 2.7800 (161.0115833d) Dec: -59 32 28.80 (-59.54133d) Equinox: J2000</td> <td></td> <td>V=12.59+/-0.2</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td>(5)</td> <td>REF4 Alt Name1: GS8626-02425</td> <td>RA: 10 44 3.8500 (161.0160417d) Dec: -59 33 10.90 (-59.55303d) Equinox: J2000</td> <td></td> <td>V=13.21+/-0.2</td> <td>Reference Frame: ICRS</td> </tr> <tr> <td>(6)</td> <td>REF5 Alt Name1: GS8626-02096</td> <td>RA: 10 43 59.1200 (160.9963333d) Dec: -59 33 20.10 (-59.55558d) Equinox: J2000</td> <td></td> <td>V=12.71+/-0.2</td> <td>Reference Frame: ICRS</td> </tr> </tbody> </table>					#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous	(1)	HD93129A	RA: 10 43 57.5000 (160.9895833d) Dec: -59 32 53.00 (-59.54806d) Equinox: J2000		V=7.3+/-0.1 O2 If*	Reference Frame: ICRS	(2)	REF1 Alt Name1: GS8626-01835	RA: 10 43 57.3000 (160.9887500d) Dec: -59 32 8.40 (-59.53567d) Equinox: J2000		V=12.8+/-0.2	Reference Frame: ICRS	(3)	REF2 Alt Name1: GS8626-02625	RA: 10 43 56.2600 (160.9844167d) Dec: -59 32 28.20 (-59.54117d) Equinox: J2000		V=13.34+/-0.2	Reference Frame: ICRS	(4)	REF3 Alt Name1: GS86260-1570	RA: 10 44 2.7800 (161.0115833d) Dec: -59 32 28.80 (-59.54133d) Equinox: J2000		V=12.59+/-0.2	Reference Frame: ICRS	(5)	REF4 Alt Name1: GS8626-02425	RA: 10 44 3.8500 (161.0160417d) Dec: -59 33 10.90 (-59.55303d) Equinox: J2000		V=13.21+/-0.2	Reference Frame: ICRS	(6)	REF5 Alt Name1: GS8626-02096	RA: 10 43 59.1200 (160.9963333d) Dec: -59 33 20.10 (-59.55558d) Equinox: J2000		V=12.71+/-0.2	Reference Frame: ICRS
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Proposal 11294 - Visit 02 - The orbit of the most massive known astrometric binary

Fixed Targets (continued)	#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes	Miscellaneous
	(7)	REF6	RA: 10 43 57.6600 (160.9902500d)		V=12.34+/-0.2	Reference Frame: ICRS
		Alt Name1: GS8626-02077	Dec: -59 33 38.80 (-59.56078d)			
			Equinox: J2000			
(8)	REF7	RA: 10 43 53.7000 (160.9737500d)		V=12.42+/-0.2	Reference Frame: ICRS	
	Alt Name1: GS8626-00153	Dec: -59 33 28.70 (-59.55797d)				
		Equinox: J2000				
(9)	REF8	RA: 10 43 46.6900 (160.9445417d)		V=9.5+/-0.2	Reference Frame: ICRS	
	Alt Name1: GS8626-00123	Dec: -59 32 54.50 (-59.54847d)				
	Alt Name2: TR14-20	Equinox: J2000				

Exposures	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
	1		(1) HD93129A	FGS, TRANS, 1	F5ND	SCANS=1; STEP-SIZE=2		Sequence 1-17 Non-Int	75.0 Secs [==>]	[1]
	2		(1) HD93129A	FGS, TRANS, 1	F5ND	SCANS=16; STEP-SIZE=0.5	SAME POS AS 1	Sequence 1-17 Non-Int	992.0 Secs [==>]	[1]
	3		(1) HD93129A	FGS, POS, 1	F5ND		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	4		(2) REF1	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	5		(3) REF2	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	6		(4) REF3	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	7		(5) REF4	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	8		(2) REF1	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	9		(1) HD93129A	FGS, POS, 1	F5ND		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	10		(9) REF8	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	11		(8) REF7	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	12		(7) REF6	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
13		(5) REF4	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]	

Proposal 11294 - Visit 02 - The orbit of the most massive known astrometric binary

Exposures (continued)	#	Label	Target	Config,Mode,Aperture	Spectral Els.	Opt. Params.	Special Reqs.	Groups	Exp. Time/[Actual Dur.]	Orbit
		14		(6) REF5	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]
	15		(1) HD93129A	FGS, POS, 1	F5ND		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	16		(2) REF1	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]
	17		(5) REF4	FGS, POS, 1	F583W		SAME POS AS 1	Sequence 1-17 Non-Int	6.0 Secs [==>]	[1]

