

A New Companion for STF 2590, WDS 19523+1021

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Abstract: A new companion in Struve 2590 (WDS 19523+1021STF 2590) is described. This is a multiple star in the constellation Aquila and is composed of four components. The new component, identified in CCD images, is not present in the WDS.

Introduction

On August 12, 2011 I ran some footage CCD to make some routine astrometric measurements of double stars in the W. Struve catalog.

Consulting the Washington Double Star Catalog, I noticed that STF 2590 (WDS 19523+1021, R.A. 19 52 15.58; DEC. +10 21 05.8) has four components, but the CCD images show a new component E (Mv 13.5) for this multiple star system.

Methods

For STF 2590, as shown in Table 1, the Washington Double Star Catalog (WDS) lists the measures for the AB, AC and CD pairs, but no measurement for an E component. CCD images, however, show a star near the B component of this multiple star system. The Aladin Sky Atlas (catalogs "SDSS-DR7, PPMXL, NOMAD1 e 2MASS-PSC") and the 2MASS-PSC indicate that this star is "12521526+1021199" with a visual magnitude of 13.5.

The latest measures of the Washington Double Star Catalog were made in 2000 for the pair AC and

in 2007 for pairs AB and CD.

I consulted the articles published in the Journal of Double star Observations (www.jdso.org) and found that Edgardo Rubén Masa Martín, in 2007, performed astrometric measurements for the AB and CD pairs [Masa Martín, 2009]. In note 96, in the same article, Masa states that component A is a variable star.

Figure 1 shows an image of STF 2590 with the E component, obtained with Schmidt-Cassegrain telescope 200/2000.

Astrometric Measurements and Data Analysis

The astrometric measurements were performed with the software REDUC (By Florent Losse) and the calibration star used was STF 2777 (WDS 21145+1000STF 2777; Theta: 6° - Rho: 74,1").

The telescope used was a Schmidt-Cassegrain 200/2000 on German equatorial mount and the optical train was composed of CCD Camera DMK 21AU with IR/UV cut filter.

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Table 1: Astrometric measurements of STF 2590 from the WDS

Name ID WDS	Theta	Rho	Mv1 - Mv2	Epoch	Coordinate WDS	
					R.A.	DEC.
STF 2590 AB 19523+1021	309°	13.5"	6.50 - 10.31	2007	19 52 15.58	+10 21 05.8
STF 2590 AC 19523+1021	309°	115.3"	6.50 - 11.6	2000	19 52 15.58	+10 21 05.8
STF 2590 CD 19523+1021	272°	8.3"	11.6 - 12.2	2007	19 52 09.50	+10 22 18.3

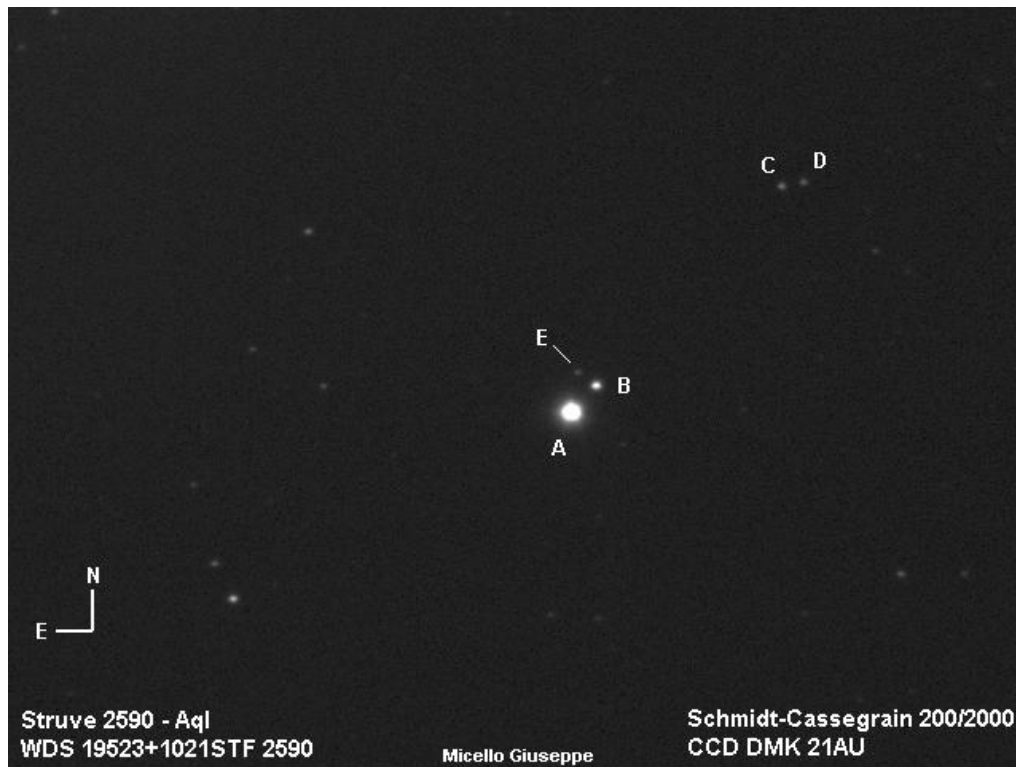


Figure 1: Image of STF 2590 showing the E component. Image by the author.

As shown in Table 2, I updated the measurements for the pairs AB, AC and CD and performed, for the first time, the measurements for the pair AE: Theta: = 342.34° and Rho = 15.057"

The catalog 2MASS-PSC catalog gives the quality flag "AAA", indicating the best quality JHK magnitudes which are: J - H - K = 12.608 - 12.352 - 12.328 and a visual magnitude of 13.5. Unfortunately, no

proper motion for this star is reported in the 2MASS-PSC, NOMAD1 and PPMXL catalogs.

The SDSS-DR7 catalog, indicates the component E as: "class 6 = Star: A a self-luminous gaseous celestial body". Figure 2 gives the astrometric data from the SDSS (Sloan Digital Sky Survey - <http://cas.sdss.org/astro/en/tools/explore/>).

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Table 2: New astrometric measurements of STF 2590 AB, AC, and CD. First measurements new pair AE and probable new name.

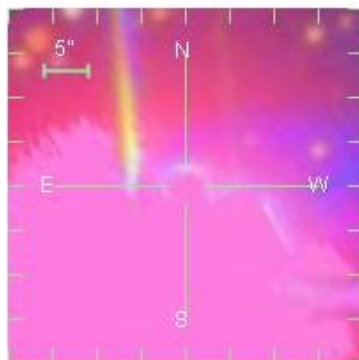
Name and ID WDS	Theta	Rho	Mv1 - Mv2 WDS	Epoch	Coordinate WDS	
					R.A.	DEC.
STF 2590 AB 19523+1021	309.5°	13.55"	6.50 - 10.31	2011.6113	195215.58	+102105.8
STF 2590 AC 19523+1021	309.3°	114.09"	6.50 - 11.6	2011.6113	195215.58	+102105.8
STF 2590 CD 19523+1021	272.1°	8.21"	11.6 - 12.2	2011.6113	195209.50	+102218.3
New Pair AE	Theta	Rho	Mv1 - Mv2	Epoch	Coordinate WDS	
					R.A.	DEC.
AE (19523+1021)	342.3°	15.05"	6.50 - 13.5	2011.6113	195215.58	+102105.8

SDSS J195215.26+102119.8

Type	RA,dec		ObjID
	Decimal	Hexagesimal	
STAR	298.06359691,10.35551665	19:52:15.26,+10:21:19.85	758877291588943878

Column names link to glossary entries. Move mouse over a column name to get its units.

mode	PRIMARY
status	PRIMARY OK_STRIPE OK_SCANLINE PSEGMENT RESOLVED OK_RUN GOOD SET
flags	DEBLENDED_AT_EDGE STATIONARY BINNED1 DEBLENDED_AS_PSF NOTCHECKED SATURATED INTERP COSMIC_RAY CHILD EDGE
PrimTarget	
SecTarget	



u	g	r	i	z		
15.74	14.16	13.77	13.56	13.70		
err u	err g	err r	err i	err z		
0.01	0.00	0.00	0.00	0.00		
run	rerun	camcol	field	obj	rowc	colc
4832	648	2	325	6	446.5	807.4
fiberMag r	petroMag r	devMag r	expMag r	psfMag r	modelMag r	
14.06	13.80	13.77	13.77	13.75	13.77	
extinction r	petroRad r	parentId		nChild		
0.95	1.547	758877291588943874		0		

Figure 2: Screen shot of SDSS astrometric data on the new E component.

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Conclusions

One of the main questions is why has the E component not been cataloged? The article by Masa E. R. indicates the A component is a variable star, therefore it may be that the E component was not seen for the variability of the principal component. But a variable star may be the same component E, object of study for the next steps.

Acknowledgments

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A special thanks to Adriano Dragone for the help and advice.

References

- Brian D. Mason, Gary L. Wycoff, and William I. Hartkopf.* Washington Double Star Catalog - <http://ad.usno.navy.mil/wds/>
- The Aladin Sky Atlas* - <http://aladin.u-strasbg.fr/aladin.gml>
- Sloan Digital Sky Survey* - <http://cas.sdss.org/astro/en/tools/explore/>
- Masa E. R., 2009 “CCD Double-Star Measurements at Observatorio Astronómico Camino de Palomares (OACP): First Series”, *JDSO*, **5**, 18, 2009.

