

COMMISSION 27 OF THE I. A. U.  
INFORMATION BULLETIN ON VARIABLE STARS

Number 1407

Konkoly Observatory  
Budapest  
1978 April 3

GLIESE 867 - A NEW FLARE-STAR SYSTEM

Gliese 867 is a visual double star, both components of which are classified dMe (Dyer, 1954). Kunkel (1975) has included both stars in his list of known flare stars solely on the basis of their emission-line spectra (private communication). Bopp and Espenak (1977) have forwarded evidence for photometric variations in G867A. We confirm here that both G867A and B flare and that G867A undergoes significant night-to-night variations.

Observations were carried out on the 0.75 meter reflector at the South African Astronomical Observatory using a high-speed pulse-counting photometer belonging to the University of Cape Town's Department of Astronomy. The latter was equipped with an Amperex 56DVP photomultiplier tube and glass filters approximating to the Johnson UBV system. For further details of the instrumentation see Nather and Warner (1971).

G867A was monitored on six nights totalling 13.1 hours. Two flares were recorded one of which was preceded by a precursor. Details of the observations are given in Table 1(a). Table 1(b) gives results of observations of G867B totalling 6.6 hours, in which time twenty-one flares were observed. Light curves for these flares will be published elsewhere.

G867A was also compared on four nights in U, B and V to a nearby  $10^m$  star  $\gamma$  ( $\alpha(1950) \sim 22^h 35^m 2$   $\delta(1950) \sim -20^\circ 42' 7$ ). This star was checked against HD214380 for constancy. No variations of amplitude greater than  $0.003^m$  are indicated. Results are given in Table 2 as differential magnitudes in the sense  $\Delta V' = V'(\gamma) - V'(G867A)$  and are in an instrumental system, untransformed to Johnson UBV. Night-to-night variations are confirmed but our results show a tendency to be redder in (B-V) when brighter in V rather than the reverse as found by Bopp and Espenak (1977).

G867 is a particularly interesting flare star. Component B was extraordinarily active during the period of our observations.

Component A is also known to be a 4.1 day spectroscopic binary, both components of which are of the same spectral type. (Herbig and Moorhead, 1965). One, however, is considerably stronger in emission than the other. It would be of interest to determine whether one or both members of G867A contribute to the flaring and in what proportion.

Further study of the G867 system is now being planned. Application has been made for telescope time during August/September 1978. Observers interested in undertaking observations at this or another time could contact the undersigned with a view to making a coordinated effort.

P. BRENDAN BYRNE  
Armagh Observatory  
Armagh BT61 9DG  
N. Ireland

References:

- Bopp, B.W. and Espenak, F., *Astron. J.*, 82, 916 (1977)  
Dyer, E.R., *Astron. J.*, 59, 218 (1954)  
Herbig, G.H. and Moorhead, J.M., *Astrophys. J.*, 141, 649 (1965)  
Kunkel, W.E., "Variable Stars and Stellar Evolution", IAU Symp. No. 67, Ed. V.E. Sherwood and L. Plaut., D. Reidel, Holland (1975) p. 15  
Nather, R.E. and Warner, B., *Mon. Not. R. Astron. Soc.*, 152, 209 (1971)

Table 1(a) - G867A

Date	Time of Observation (U.T.)		Flares			Comment		
	Begin	End	Time of Peak	$I_f - I_o / I_o$	$3\sigma / I_o$	Integ- ration	Colour	Gen- eral
1977								
Oct. 25	18.20.12	18.43.32				2 <sup>s</sup>	U only	
	18.54.29	19.20.09				"	"	
	19.28.54	19.59.54				"	"	
	20.10.51	20.46.31				"	"	
	20.54.29	20.58.19	20.57.05	0.404	0.036	"	"	Precursor?
	21.00.25	21.05.41	21.03.45	0.871	0.036	"	"	
	21.07.12	21.25.13				"	"	
	21.33.42	22.20.14				"	"	
Oct. 26	18.13.20	18.36.20				"	"	
	18.46.27	19.27.47				"	"	
	19.35.26	20.12.30				"	"	
	20.19.53	20.56.33				"	"	
	21.03.57	21.37.17				"	"	
	21.44.08	22.15.08				"	"	
	22.22.56	22.38.50				"	"	
Oct. 28	19.15.50	19.36.15				3 <sup>s</sup>	"	
	19.41.13	21.20.07	20.55.12	0.310	0.011	"	"	
	21.22.28	21.33.52				"	"	
Nov. 18	18.25.25	19.01.00				2 <sup>s</sup>	UB&V	
	19.13.20	19.38.00				each colour	"	
	19.40.34	19.58.10				"	"	
Nov. 19	18.34.31	18.35.34				3 <sup>s</sup>	"	
	18.37.26	20.15.00				each colour	"	
Nov. 21	19.12.34	20.28.00				"	"	

Table 1(b) - G867B

Date	Time of Observation (U.T.)		Flares			Comment		
	Begin	End	Time of Peak	$I_f - I_o / I_o$	$3\sigma / I_o$	Integ- ration	Colour	Gen- eral
1977								
Sept. 10	21.20.52		21.25.32	0.271	0.038	2 <sup>s</sup>	U only	
			21.35.16	0.348	0.037	"	"	
			21.44.52*0.332	0.038	0.038	"	"	*Between
			21.46.38*0.346	0.038	0.038	"	"	21 <sup>h</sup> 43 <sup>m</sup> and
			21.49.48*0.533	0.038	0.038	"	"	22 <sup>h</sup> 50 <sup>m</sup> ,
			21.59.12*0.648	0.038	0.038	"	"	there was
			22.09.09*0.305	0.038	0.038	"	"	a general
			22.12.23*0.515	0.038	0.038	"	"	rise in the
			22.19.07*0.372	0.038	0.038	"	"	star's
			23.25.04	0.668	0.058	"	"	brightness
			23.36.00	0.285	0.058	"	"	of 20%. Am-
Sept. 11		00.45.01	00.06.29	0.264	0.058	"	"	plitudes of
"	"	21.17.52	21.29.06	0.427	0.132	"	"	these flares
			21.34.40	0.213	0.132	"	"	are referred
			21.44.44	0.626	0.281	"	"	to the qui-
			22.01.48	0.340	0.234	"	"	escent part
			22.17.24	0.497	0.181	"	"	of the light
			22.24.36	0.219	0.130	"	"	curve.
			23.08.26	0.351	0.102	"	"	
			23.45.37	0.218	0.194	"	"	
Sept. 12		00.45.08	00.23.23	0.451	0.152	"	"	

Table 2 - G867A

Date	Time (U.T.)	Sec z	$\Delta V'$	$\Delta(B'-V')$	$\Delta(U'-B')$
25.10.1977	20:49	1.106	1.170	+1.947	+1.148
26.10.1977	20:14	1.052	1.059	+1.920	+1.030
18.11.1977	19:09	1.115	1.063	+1.916	+1.024
19.11.1977	18:30	1.061	1.085	+1.950	+1.087