

COMMISSIONS 27 AND 42 OF THE IAU
INFORMATION BULLETIN ON VARIABLE STARS
Number 3848

Konkoly Observatory
Budapest
26 February 1993
HU ISSN 0324 - 0676

RECENT UBVR MAGNITUDES FOR RHO Cas

Rho Cas is a yellow hypergiant that undergoes both pulsation and mass-loss episodes accompanied by complex spectrum and photometric changes. Zsoldos & Percy (1991) have found an underlying significant period of 298.5 days which has remained constant for nearly three decades.

Photometrically, Rho Cas has been well observed. Its light variations are semi-regular in nature with occasional deep minima which are likely associated with the mass-loss events. This paper continues a series of observations of this star. All data were obtained utilizing the 0.6-m telescope of the Corralitos Observatory and two photometric systems, one based on an EMI 9924A tube and the other on an R4457, both ambient temperature. Considerable care was taken in insuring that sufficient standard stars were observed so as to maintain consistency in magnitude and colors between the two systems. In previous papers (Halbedel, 1988, 1991), two comparison stars were utilized: Tau Cas and HR 9010. However, in the last two observing seasons, Tau Cas has been found to be brighter than normal (Halbedel, to be published). Therefore, it has been dropped as a comparison star for the Rho Cas magnitudes of the last two observing seasons. However, Tau Cas has remained stable enough over the previous years of observing to allow the previously cited Rho Cas magnitudes to continue to be valid. For the most recent magnitudes of Rho Cas (which appear in Table 1), only HR 9010 ($V=5.510$; $B-V=+1.650$; $U-B=+1.810$; $V-R=+1.290$) is used as a comparison. In the future, another comparison star will be added in order to unambiguously insure that HR 9010 is nonvariable.

Figure 1 shows a composite light curve for Rho Cas. It incorporates data from all recent sources: Halbedel (1988, 1991, and this paper), Leiker & Hoff (1987, 1990), Leiker, Hoff, Nesbella et al. (1988), Leiker, Hoff, & Milton (1989), Leiker, Hoff, & Caruso (1991), and Zsoldos & Percy (1991). There is surprisingly little scatter when one considers the multiplicity of sources used. The behavior of the star is essentially unchanged: it still undergoes semiregular variations, though the most recent increase in mean magnitude has ceased and the star is reddening again. At present, there are too few $U-B$ and $V-R$ magnitudes to delineate a trend in those colors.

Rho Cas will continue to be observed indefinitely at the Corralitos Observatory.

The author would like to most gratefully acknowledge a Theodore Dunham, Jr. grant of the Fund for Astrophysical Research for purchase of photometric equipment.

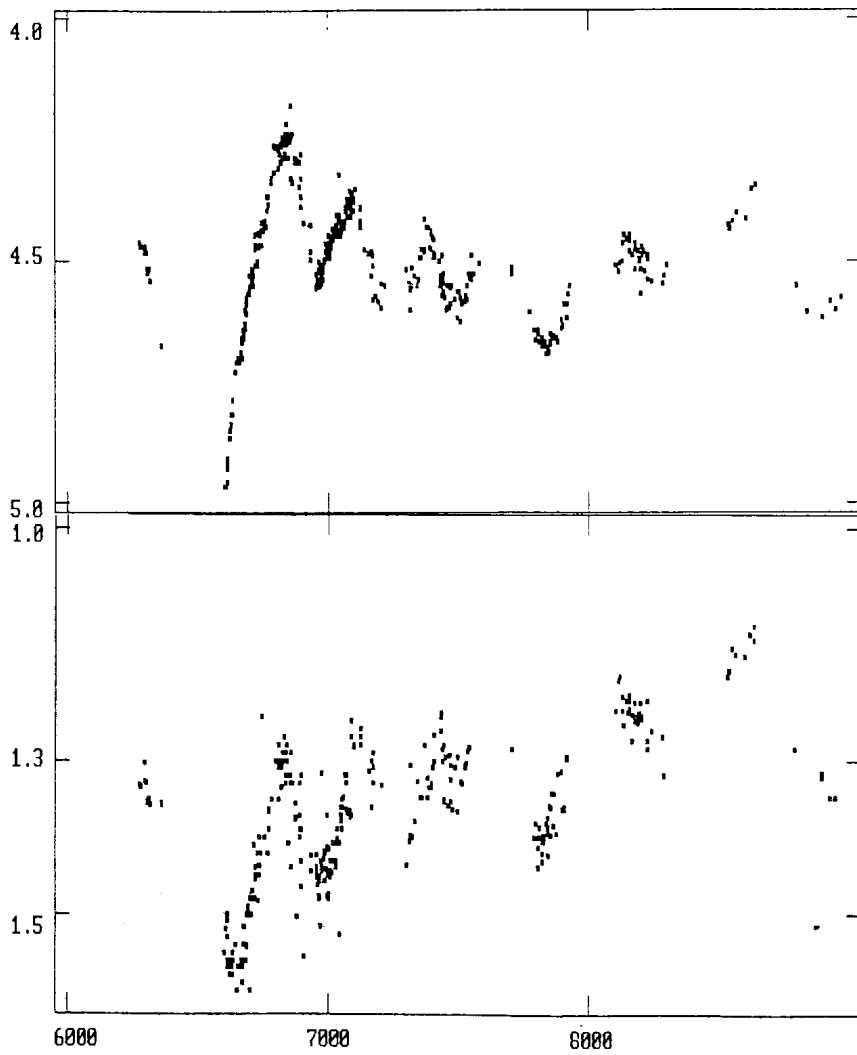


Figure 1. Magnitudes and colors for Rho Cas. The top diagram shows V, the bottom B-V.
Julian Date is JD - 2440000.

Table 1

UBVR magnitudes for Rho Cas

Since only one star was used for comparison purposes, there are no standard errors

JULIAN DATE (2440000+)	V	B-V	U-B	V-R
8532.78611	4.429	+1.192		
8535.74861	4.434	1.184		
8546.70833	4.417	1.155		
8562.69444	4.404	1.164		
8597.67292	4.413	1.166		
8620.59583	4.353	1.138		
8636.59028	4.342	1.126		
8637.59236	4.343	1.144		
8800.93056	4.550	1.286		
8842.89306	4.606			
8898.78958	4.620	1.318	+1.190	+1.176
8901.75347	4.618	1.322	1.211	1.167
8932.77292	4.586	1.349	1.268	1.161
8951.70903	4.600	1.347	1.259	1.196
8973.65694	4.579			

ELAINE M. HALBEDEL
 Corralitos Observatory
 P.O. Box 16314
 Las Cruces, NM
 U.S.A. 88004

References:

- Halbedel, E. M., 1988, *IBVS*, No. 3171
 1991, *IBVS*, No. 3616
 Leiker, P. S. & Hoff, D. B., 1987, *IBVS*, No. 3020
 1990, *IBVS*, No. 3490
 Leiker, P. S., Hoff, D. B., & Caruso, J. R., 1991, *IBVS*, No. 3639
 Leiker, P. S., Hoff, D. B., & Milton, R., 1989, *IBVS*, No. 3345
 Leiker, P. S., Hoff, D. B., Nesbella, J., Gainer, M., Milton, R., & Pray, D., 1988,
IBVS, No. 3172
 Zsoldos, E. & Percy, J. R., 1991, *AAp*, **246**, 446