

a scatter also occurs for several metal lines, especially Ca II and Fe I. These data were not used for period search. Two methods for period determination were used:

1. Method of Lafler and Kinman (1965).
2. "Fourier transform" (one-harmonic least squares fit by using the program FOUR by Andronov (1994)).

The search was carried out for period intervals 5000...15000 days (13.7...41 years). The best results were obtained for the metal lines because of the smaller scatter in the data. Both methods yielded almost the same results:

Lafler & Kinman	Fourier analysis
metal lines	
6411 <sup>d</sup> (17.6 yr)	6580 <sup>d</sup> (18 yr)
12450 <sup>d</sup> (34 yr)	12856 <sup>d</sup> (35yr)
H lines	
6500 <sup>d</sup>	4670 <sup>d</sup>
12400 <sup>d</sup>	11468 <sup>d</sup>

The calculated value of the orbital period of Pleione ( $\approx 35$ yr) agree well with the variations of the spectral properties of the star (shell - non-shell phase). Our results agree well also with the conclusions published by Gies et al. (1990). In this work time resolved  $H_{\alpha}$  spectroscopy was carried out during an occultation of Pleione by the moon. The observations concluded to an asymmetric envelope which is explained by a companion with  $M = 2M_{\odot}$ . During the periastron passage of the companion mass exchange by the primary star increases and a new shell phase begins. The semimajor axis was determined to be  $a = 19.1$

A.U., the eccentricity  $e = 0.46$  and the inclination  $0^{\circ} < i < 43^{\circ}$ .

For an exact determination of the orbital parameters more radial velocity measurements are necessary.

#### References

- Andronov I.L.: 1994, *Odessa Astron. Publ.*, 7, 49.  
 Gies D.R., McKibben W.P., Kelton P.W., Opal C.B., Sawyer S.: 1990, *A.J.*, 100, 1601.  
 Lafler J., Kinman T.D.: 1965, *Ap. J. Suppl. Ser.*, 11, 216.

## RHO CASSIOPEAE – GIANT OR SUPERGIANT ?

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**ABSTRACT.** Variable polarization of  $\rho$  Cassiopeae is found, with an amplitude of about 0.2 % in the V band and up to 1 % in R. It is drew attention on a conflict of luminosity from a spectral analysis (about -8 magnitude) and from a trigonometrical parallax (an ave-

rage from four measurings corresponds to +0.5 magnitude). The paper submitted to *Astronomische Nachrichten*.

**Key words:** Stars: individual - rho Cas: luminosity-polarization.

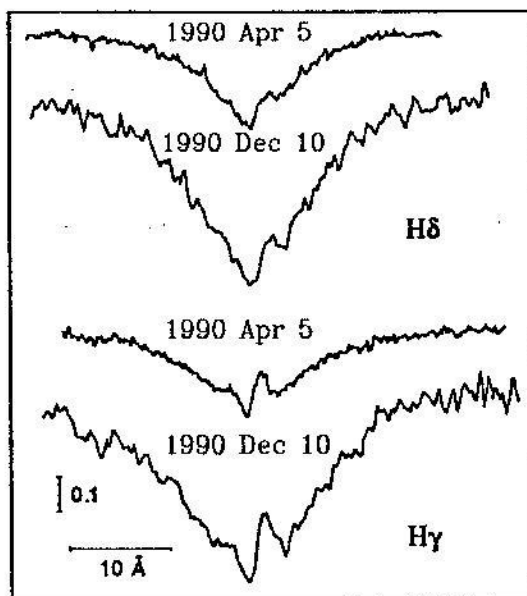


Figure 1: Variations of the profiles of the hydrogen lines  $H_{\gamma}$  and  $H_{\delta}$  in the spectrum of Pleione in 1990.