(diffusion DEC 77)

PRELIMINAR ORBITAL ELEMENTS OF THE ECLIPSING BINARY SYSTEM HD 217 796 = NN CEPHEI

The eclipsing character of the binary system HD 217 796 was first established by GEOS observers in 1976 (see GEOS NC 142 and IBVS 1231).

From the published light-curves (NC 142, NC 159) and from the additional one shown in figure 1 (obtained using my own observations), I have computed the rectified light-curve of the figure 2, by an harmonic analysis: The evidence of the arch between eclipses is poor, that indicates weakly ellipsoïdal stars.

From the rectified light-curve, I have derived the geometric and the photometric orbital elements according to the TSESEVICH method for a limb-darkening coefficient $x = 0.5$ (and for spectral type A5) .

The orbital elements computed for a partial eclipse with the primary minimum corresponding to an occultation (large star in front) are showed in table 1.
A representation of the binary system NN Cep is given in figure 3.

Conclusion : NN Cep is probably an EB - type system, but I do not exclude the EA - type because the ellipticity of the stars are very small and the values of the radii of the two bodies could be representative of a detached binary system of the algol - type. New and more precise observations are required.

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GEOMETRIC ORBITAL ELEMENTS	
orbital eccentricity	$e = 0.026$
Longitude of periastron	$\omega = 76°.043$
orbital inclination	$\lvert i \rvert = 80°.516$
ratio of radii	$k = 0.575$
longer radius of the large star	$r_1 = 0.293$
longer radius of the small star	$r_2 = 0.168$
shorter radius of the large star	$b_1 = 0.286$
shorter radius of the small star	$b_2 = 0.164$
ellipticity	$\frac{b}{a} = 0.976$
occulted area	$\alpha'' = 0.903$
transited area	$\alpha' = 0.859$

PHOTOMETRIC ORBITAL ELEMENTS	
light of large star	$L = 0.715$
light of small star	$L = 0.285$
ratio of surface brightness	$\frac{J'}{J} = 1.205$
limb darkening coefficient	$x = 0.5$ (assumed)

Table 1 . Geometric and photometric orbital elements of NN Cep.

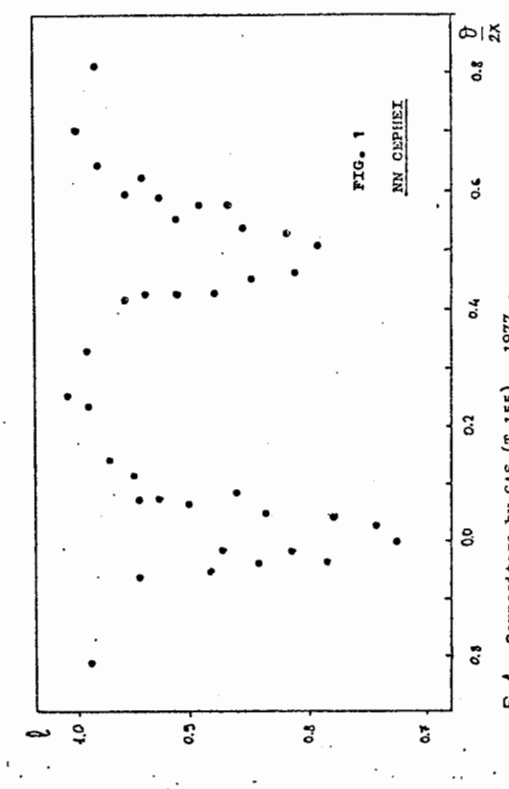


Fig.1 - Compositage by GAS (T 155) 1977 .

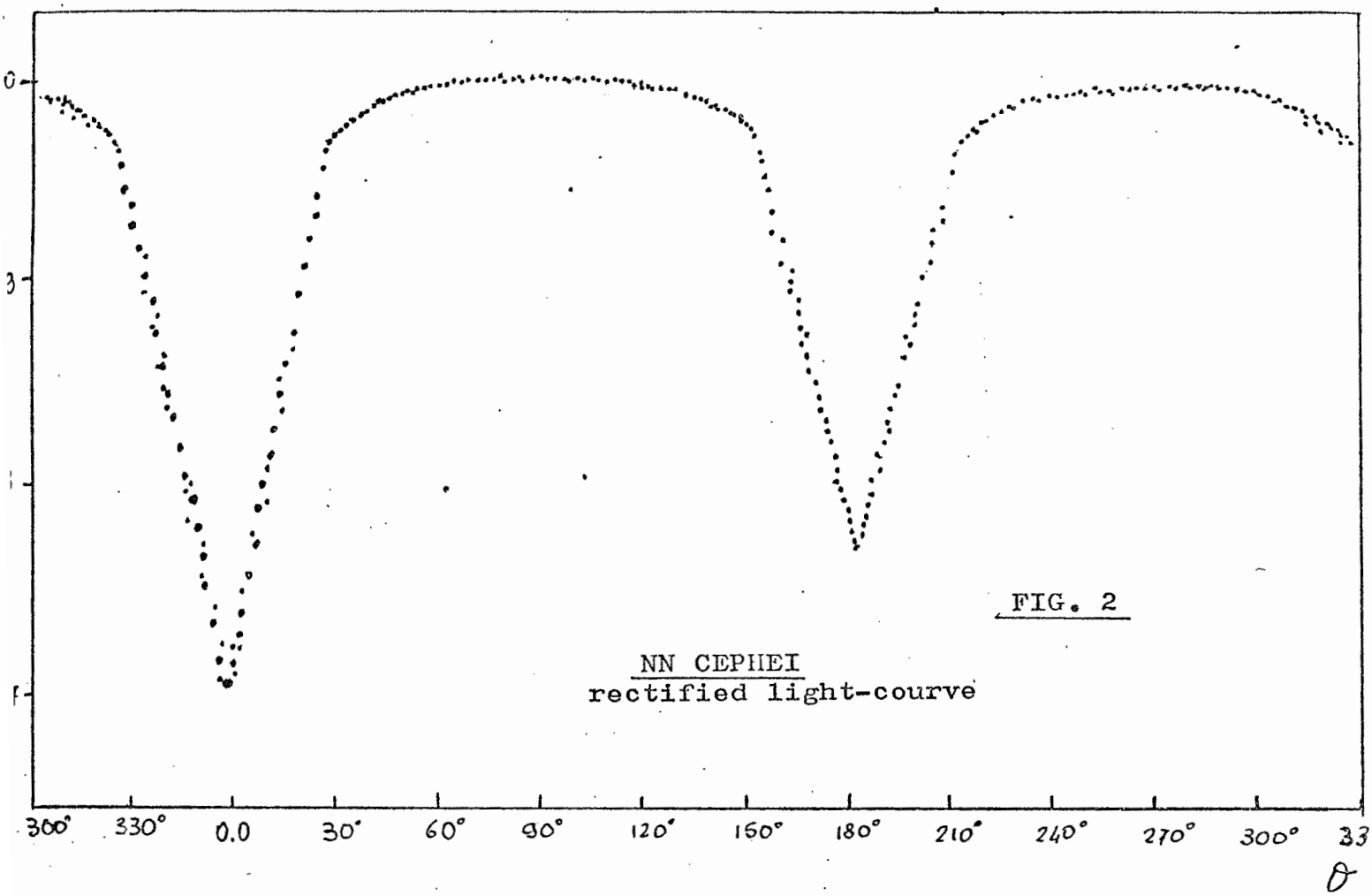
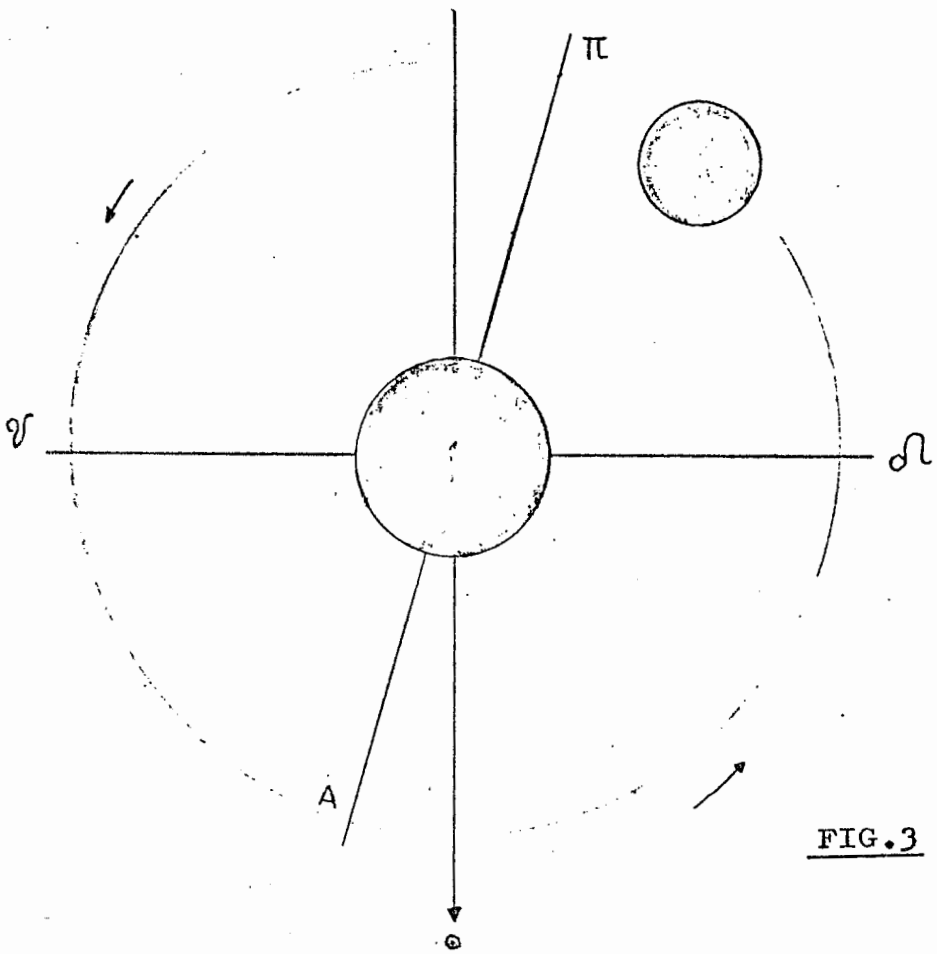


FIG. 2

NN CEPHEI
rectified light-courve



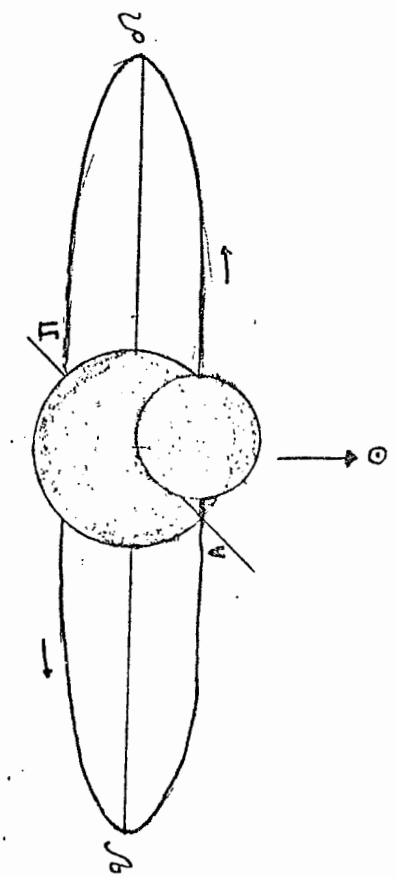


FIG.3

Graphic representation of the binary system IID 217796