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AK Her - NEW V LIGHT CURVE AND PERIOD CHANGE

Photoelectric observations of the W UMa - type eclipsing binary AK Herculis were carried out on three nights of May 16/17, May 17/18, June 29/30, 1983. The observations were made at Cracow Astronomical Observatory with the 50 cm reflector equipped with EMI 9789 QB photomultiplier. The Schott filter GG-11 in V region was used. The comparison star was BD+16^o3123 and BD+16^o3124 served as a check star. The comparison star was the same as used most often in previous investigations (Binnendijk, 1961; Woodward and Wilson, 1977; Bookmyer and Kaitchuck, 1979). Two hundred observations in V light in the sense of variable minus comparison are shown in Figure 1. A slight phase shift of secondaries to value 0.502 can be seen.

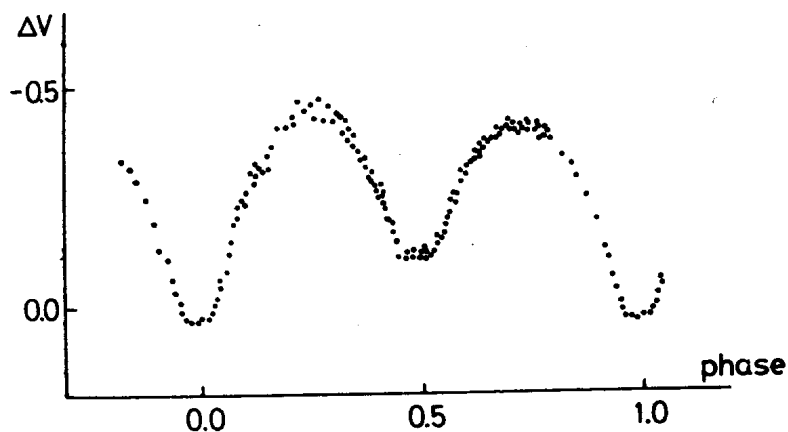


Figure 1

Times of minima obtained from these data with the Kwee and Van Voerden (1956) method are given in Table I.

J D Hel	O-C days	Min type
244 0000+		
5471.38030	+0.0139	I
+18		
5472.43500	+0.0147	II
+31		
5515.43033	+0.0148	II
+32		

The O-C values computed from the ephemeris published by Barker and Herczeg (1979)

$$\text{J.D.Hel.Min.I} = 242\,3573.7060 + 0.42152227 E$$

are plotted versus epoch in Figure 2. All points following J.D. 2433000 refer to photoelectric data.

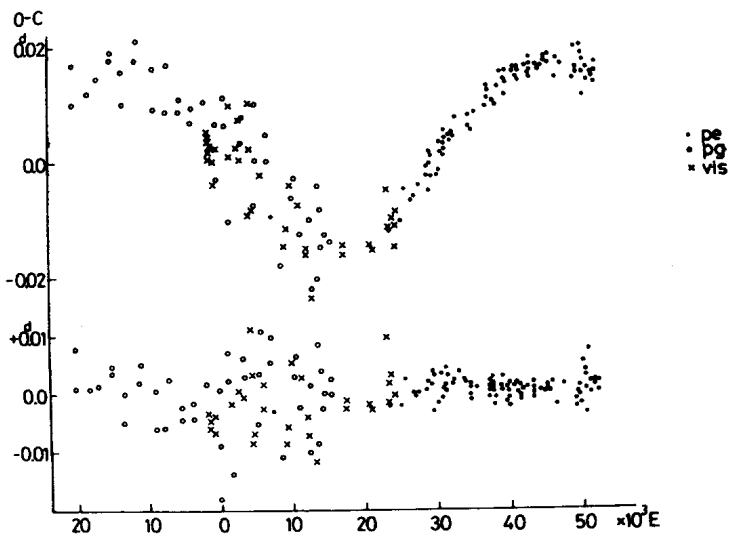


Figure 2

As the (O-C) diagram illustrates, a satisfactory light-time representation is possible as was suggested in the past (Herczeg and Schmidt, 1959; Rafert, 1982). A new period obtained for these data by a least squares fitting is equal to 65.95 years with an amplitude 0.0147. The computed residuals from this sinusoid are shown in the lower part of Figure 2. The observations of AK Her covers only 80 years, so the problem of multiplicity of system is still open (Woodward

and Wilson, 1977; Panchatsaram and Abhyankar, 1982).

From 29 photoelectric minima observed since 1976 we can find new linear elements :

$$J.D. \text{ Hel.Min. I} = 244\,2665.\overset{d}{\underset{\pm 93}{3091}} + 0.\overset{d}{\underset{\pm 19}{42152202}} \cdot E$$

The relative period change in the manner of sudden period changes is

$$\Delta P/P \sim -6 \cdot 10^{-7}.$$

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