THE PHOTOMETRIC PERIOD OF AG PEGASI

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ABSTRACT. The photometric period of AG Pegasi has been determined to be 813 days on the basis of 165 photoelectrical observations from 1961 to 1986. When splitting the interval different periods were found.

For the symbiotic star AG Pegasi different periods ranging from 733 to 830 days have been published. Most of them are near 820 days, but two periods deviate very strongly from this value: Slovak found 733+30 days using visual estimations of the AAVSO between 1974 and 1982. A period near this value was also determined by the present author with 760 days using visual estimations of the AFOEV, the AAVSO and photoelectrical observations. A period change was suggested but there wasn't an explanation for this. In 1985 Fernie published a period of 816.5 days based on 89 photoelectrical data.

Because of these strong differences a new determination has been done on the basis of 165 photoelectrical observations in V from 1961 to 1986 using the method of Lafler and Kinman.

The lightcurve shows a decline both in the mean magnitude and in amplitude. This slope has to be corrected before period determination. Fernie corrected for the slope using the maxima of brightnes only. The following correction formula considers both the maxima and minima of light:

$$V_{cor} = -0.424 \cdot 10^{-4} \, (JD-2440000) + V$$

The V magnitudes corrected by this equation are the basis for period determination. For the whole interval we got a period of 813 days. But splitting the lightcurve into two parts and doing the same procedure separately for each one different periods have been calculated:

<pre>
        time interval   period

JD = 243 7000 - 244 7000   813 days
     243 7000 - 244 1000.   853
     244 1000 - 244 7000   803
</pre>

The period of the first subinterval is nearly 50 days longer than that of the second. If this effect is real, it might be explained by shifting the hot spot on the surface of the M giant. This causes a variable rotational period of this spot. But also the scattering of the measurements and the large gap in the course of the lightcurve may cause this effect.

As a conclusion the short periods of 733 and 760 days have not been confirmed. The mean period of AG Pegasi has been determined to 813 days. This is in agreement with the determination of Fernie, but it seems difficult to get an exact period on the basis of photometric data because of the decline in mean brightnes and amplitude.
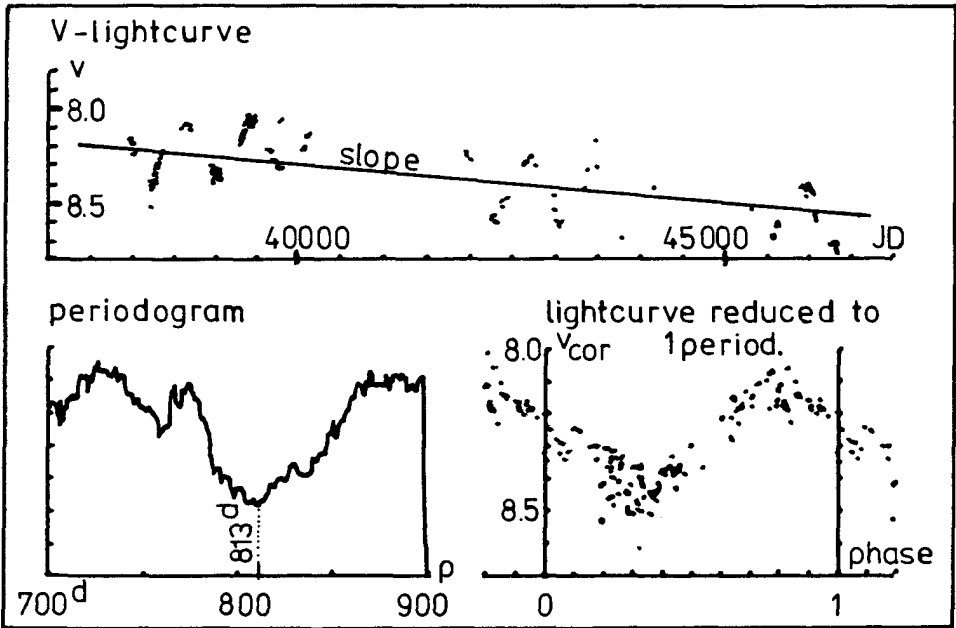
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