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REVISED PHOTOMETRIC ELEMENTS OF AY CAM

The eclipsing binary AY Camelopardalis was discovered by Strohmeier and Knigge (1961), and was observed during the years 1966-1968 by Tempesti (1969), who found out that the period of the variable is $2^d.7349658$, i.e. twice the one found earlier.

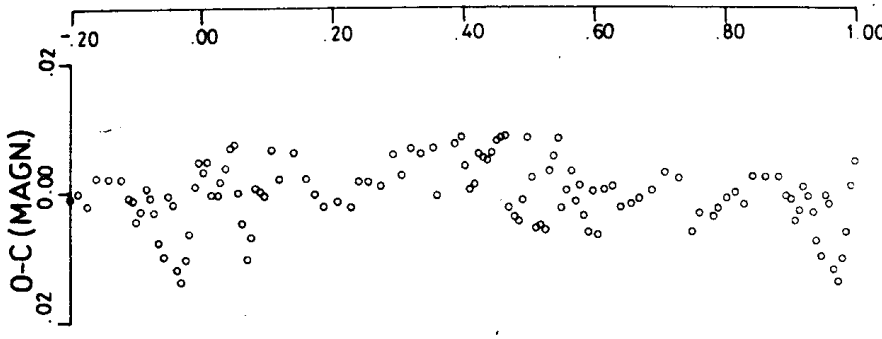
Tempesti also obtained a solution for the photometric and geometric elements using the procedure of Russell and Merrill (1952), assuming primary minimum is due to an annular eclipse, but found some departure of the model from the true system.

Using the normal points given by Tempesti (1969), reduced to 100 points in order to save computing time, we have calculated a set of photometric and geometric elements for AY Cam with the method by Wood (1971, 1973-1978). The solution, shown in the table, confirms the annular type of the eclipse occurring at primary minimum.

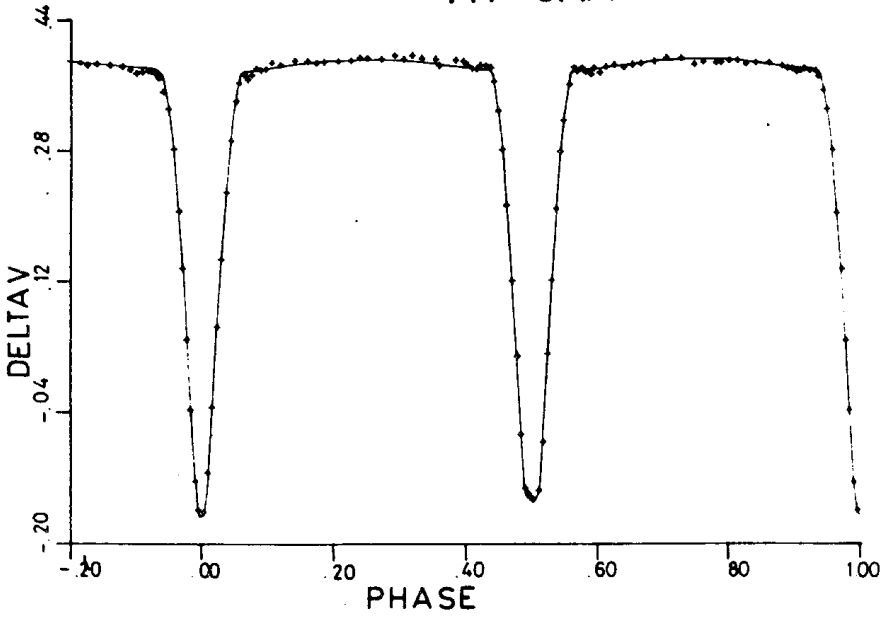
Table*)

adjusted parameters	fixed parameters
$i = 88^{\circ}.0 \pm 0.2$	$\log g_1 = \log g_2 = 4.3$
$r_1 = 0.221 \pm 0.001$	$w_1 = w_2 = 0.5$
$\kappa = r_2/r_1 = 0.747 \pm 0.002$	$n_1 = n_2 = 5.0$
$\beta_1 = 0.080 \pm 0.023$	auxiliary parameters
$\beta_2 = 0.080 \pm 0.054$	$a_1 = 0.225$ $a_2 = 0.167$
$x_1 = 0.6 \pm 0.2$	$b_1 = 0.222$ $b_2 = 0.166$
$x_2 = 0.6 \pm 0.2$	$c_1 = 0.220$ $c_2 = 0.165$
$T_{1,eq} = 6890 \text{ }^{\circ}\text{K} \pm 10$	$T_{1,pol} = 6910 \text{ }^{\circ}\text{K}$
$T_{2,eq} = 7000 \text{ }^{\circ}\text{K} \pm 10$	$T_{2,pol} = 7020 \text{ }^{\circ}\text{K}$
$q = m_2/m_1 = 0.83 \pm 0.10$	$L_1 = 0.626$
	$L_2 = 0.374$

*) for the explanation of the symbols used, see Wood (1971); also Mancuso et al. (1978).



AY CAM



The value of the mass ratio, although poorly determined, gives for the quantities y_{11} , y_{12} of the Roche lobes the values 0.391 and 0.357, respectively (Plavec and Kratochvil, 1964). A comparison with the semi-axis of the components reveals that AY Cam is a normal detached system, made of two main sequence stars, which are well inside their respective critical lobes. The values of the temperature correspond to two F0-F2 stars, as indicated by the B-V curve of Tempesti (1969). In the figure we give the computed lightcurve, plotted among the observed normal points, and the detail of the O-C (in magnitude units) obtained. In contrast with the most complete model we adopted, the non-random distribution of the O-C's displays the existence of some effect which has not yet been identified.

An accurate multicolour photometry, as well as spectrographic observations, are needed in order to get a better comprehension of the physical conditions of this system.

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References

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