

COMMISSION 27 OF THE I. A. U.
 INFORMATION BULLETIN ON VARIABLE STARS
 Number 1688

Konkoly Observatory
 Budapest
 1979 October 16

NEW ELEMENTS FOR AP LEONIS

The eclipsing binary AP Leonis was discovered by Strohmeier and Knigge (1961) and was observed by H. Mauder (1967) during the years 1966-67 and the photometric and geometric elements were determined.

In 1978 and 1979 we have observed AP Leonis through B and V-filters with 50-cm telescope of Bucharest Observatory. Using the observations in B obtained in 1978, the photometric and geometric elements have been calculated; the approximate solution resulted from a Horak-type model (1970), while the improved solution was obtained with a Wood model (1972). It was confirmed that an annular type of eclipse occurs at primary minimum and a total type eclipse during the secondary minimum. The results are given in Table and in Fig. 1 where the observations (normal points) are represented by crosses.

Table

Adjusted parameters	Fixed parameters
$i = 83.131 \pm 0.01$	$T_1(\text{eq}) = 6000^\circ\text{K}$
$r_1 = 0.5866 \pm 0.04$	$q = 0.211$
$k = 0.534 \pm 0.03$	$\beta_1 = \beta_2 = 0.25$
$T_2(\text{eq}) = 6161 \pm 217^\circ\text{K}$	$x_1 = x_2 = 0.6$
	$w_1 = w_2 = 0$
	$n_1 = n_2 = 5.0$
Auxiliary parameters	
$a_1 = 0.6355$	$a_2 = 0.3395$
$b_1 = 0.5980$	$b_2 = 0.2851$
$c_1 = 0.5263$	$c_2 = 0.2631$
$T_1(\text{pol}) = 6608^\circ\text{K}$	$T_2(\text{pol}) = 6586^\circ\text{K}$
$L_1(\text{app}) = 0.862$	$L_2(\text{app}) = 0.215$
$L_1(\text{norm}) = 0.800$	$L_2(\text{norm}) = 0.200$

The coefficients x_1 , x_2 and the temperature T_1 correspond to the spectral classes dG0 + G2 of the stars. The mass ratio was fixed at the value obtained in a first approximation. Six iterations were necessary for the convergence of the solution with the model by Wood.

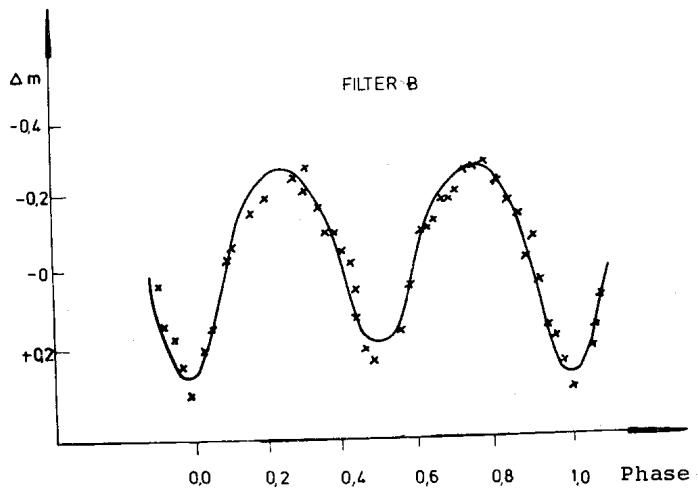


Figure 1

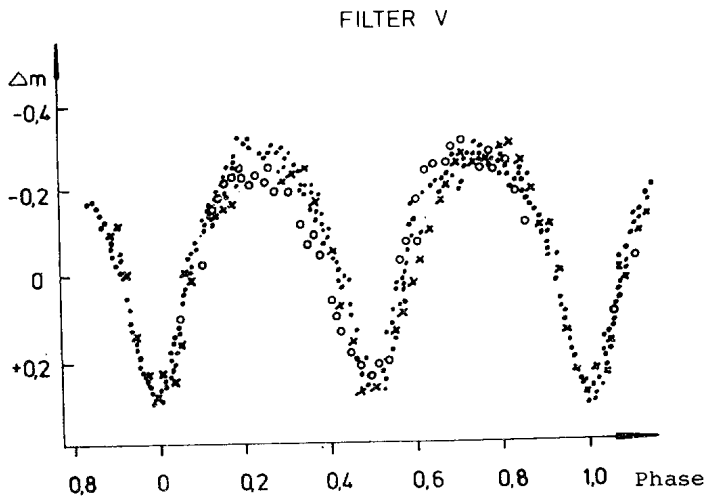


Figure 2

Comparing our observations with those by Mauder (Fig.2 where points are Mauder's observations, while circles and crosses are ours) one can see a change in the secondary maximum. The difference in magnitude between the values obtained in 1966-67 and 1978-79 is about 0.06.

The work concerning the interpretations of the observations in V filter is in progress as well as new improvements of model. More observations are needed in the future in order to determine more precisely the features of the light curve and the physical conditions in the system.

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