

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

NUMBER 596

Konkoly Observatory
Budapest
1971 December 2

THE ECLIPSING BINARY AB CASSIOPEIAE AS A DELTA SCUTI STAR

The eclipsing binary AB Cas has been observed in several nights from 1967 to 1971 with the 40-cm refractor of the Teramo Observatory; an E.M.I. 9502 photomultiplier coupled with a Schott GG14 filter assured a response very close to the V magnitude system.

The light curve derived by these observations is shown in Fig.1; the phases have been computed according to the elements

$$\text{Hel. Minimum} = \text{J.D. } 2439771.580 + 1^{\text{d}}.3668755$$

and the magnitude differences are referred to an anonymous star whose V magnitude resulted $10^{\text{m}}.50$.

A $0^{\text{m}}.10$ deep secondary minimum is detectable, but the most interesting feature is the presence of brightness fluctuations of amplitude $0^{\text{m}}.05$ and period $1^{\text{h}} 24^{\text{m}}$; the incommensurability with the eclipsing period causes the cancelling out of these fluctuations in the most part of the composite light curve, but they are clearly apparent in the phase interval $0^{\text{P}}.08 - 0^{\text{P}}.20$ where almost all the observations belong to the same night. Some single-night runs are reported on a larger scale against the phase of the binary period (in minor panel of Fig.1 and in Fig.2).

The average period derived from several cycles observed in 1970 and 1971 results to be $0^{\text{d}}.058$ but the single cycles show deviations reaching $0^{\text{d}}.007$. The brightness fluctuations seem to be enhanced during the secondary

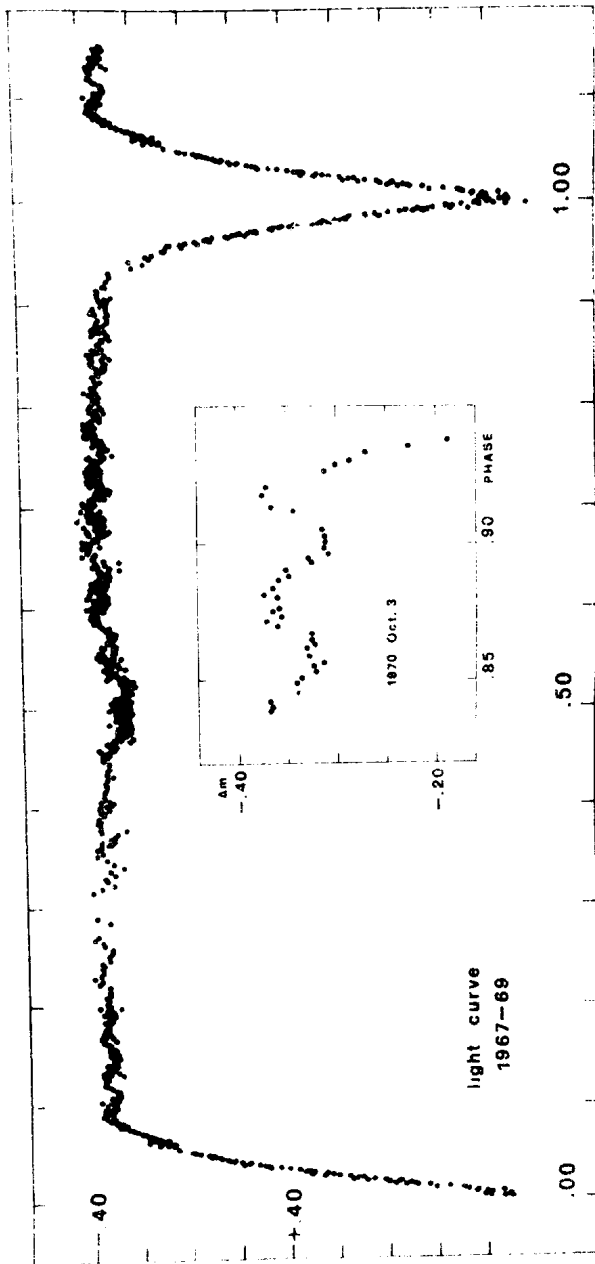


Figure 1

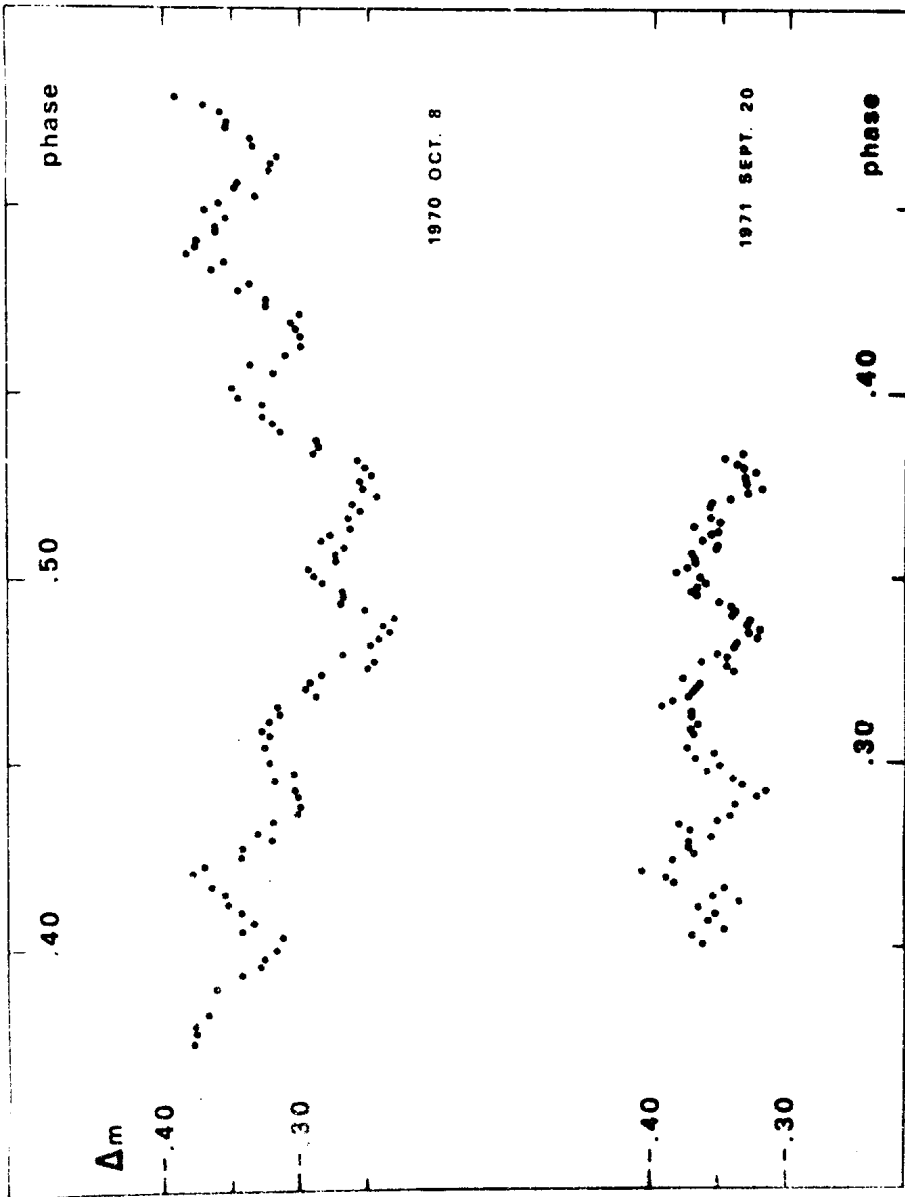


Figure 2

minima and disappear near the central phase of the primary minima: a behaviour to be expected in the case of an intrinsic variability of the warmer star which is almost totally eclipsed. The photometric patterns and the spectrum and luminosity of the primary component - an A3 star of absolute visual magnitude $+2^m.2$ - allow to classify the star as a Delta Scuti variable.

AB Cas is a detached system consisting in an A3 and an early K main sequence stars; the mass of the A3 star has been evaluated in 2 solar masses (Gaposhkin, 1940): a typical value for a Delta Scuti variable. Furthermore, the star fits well the period-luminosity relation found for this class of variables (Kam-Ching Leung, 1970).

A detailed study of AB Cas will be published elsewhere.

P. TEMPESTI

Osservatorio Astronomico di Teramo
Italy

References:

S. Gaposhkin, 1940. Harvard Reprint No.201
Kam-Ching Leung, 1970. Astron. J. 75, 643.