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MT CASSIOPEIAE, ANOTHER CONTACT BINARY WITH COMPLETE ECLIPSES

MT Cas was discovered by Götz and Wenzel (1956) as a W UMa type eclipsing binary. They did not publish a light curve, but the amplitudes were given as  $O^m.4$  and  $O^m.3$  for the primary and secondary minimum, respectively.

This 13th magnitude star was observed at Hoher List Observatory with the double beam photometer at the 1.06m telescope in B between October and December, 1981 (JD 2444901, 2444914, 2444941, 2444955). Comparison star was a 12th magnitude star 5' north of MT Cas. This star is  $O^m.8$  redder than the variable. Unfortunately it was not possible to fill the gaps in the light curve at phases  $O^p.05$  and  $O^p.40$ , and only the observations between  $O^p.43$  and  $O^p.93$  could be obtained during very good weather conditions. With exception of the first night, also some additional V observations were made.

Minimum times were determined:

JD hel.	2444901.5705	Epoch	50249.5	O-C	+0 <sup>d</sup> .0442
	2444941.5925		50377.0		+0.0469
	2444955.2420		50420.5		+0.0428

Epochs and O-C's were calculated according to the light elements given by Götz and Wenzel (1956). Although the minima are now displaced by  $O^p.14$  from their predicted instants, this can still be explained by the uncertainty of the period determination from the minimum observations by Götz and Wenzel (1956).

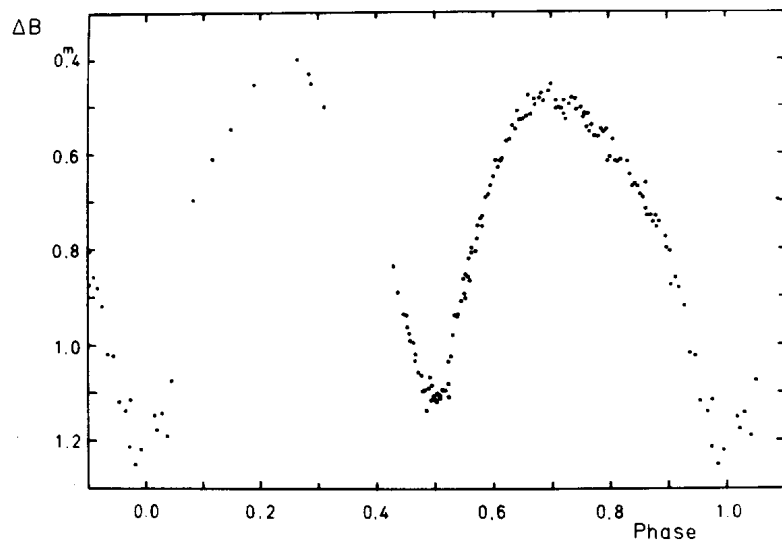


Figure 1: B observations of MT Cas

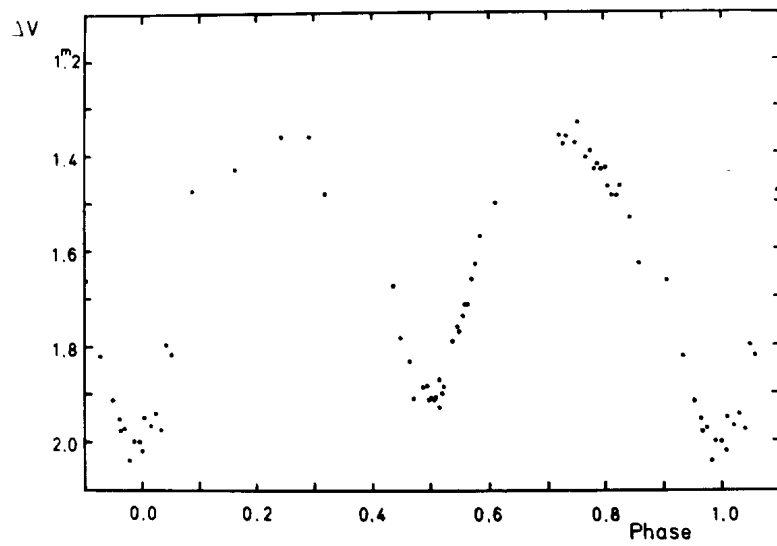


Figure 2: V observations of MT Cas

The B light curve is shown in Fig. 1. It can be seen that the amplitude of MT Cas is much larger than previously assumed. It amounts roughly  $0^m.7$ . The minima have flat intervals of  $0^p.04$ . It is concluded that this eclipsing binary has complete eclipses. However, between the second and third contacts of both eclipses the light curve is slightly ascending. This "intrinsic" variability affects also the symmetry of the incomplete eclipse parts and complicates the determination of minimum times, therefore, as well as attempts for a solution of the system parameters.

The maximum at phase  $0^p.25$ , though poorly covered with observations, seems to be a little brighter than the other one. Considerable displacements of the maxima from the mid-points between the minima towards the secondary minimum are visible. The wider primary minimum suggests that MT Cas is of W type. This is not unusual if the period and the amplitude (moderately great mass ratio) is taken into account.

Fig. 2 shows the V observations. The main features of this light curve are the same as in B in principle, but the amplitude is smaller. Since V observations are lacking for the first observing night, the B and V light curves may only be comparable with restriction, however.

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Reference:

Götz, W., Wenzel, W., 1956, Veröff. Sternw. Sonneberg 2, 279