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IMPROVED OUTBURST LIGHTCURVES OF THE NOVAE EY Aql, BC Cas, MT Cen, AND V745 Sco

During a stay at the Harvard College Observatory, photographic plates were examined for outburst records of novae, to determine improved positions and to prepare finding charts for a forthcoming catalogue and atlas of galactic novae (Duerbeck 1983). In a few cases, novae could be identified that had been observed and described elsewhere, and some essential points could be added to the existing light curves.

Table I. Observations

Nova	plate series	J.D. 2400000+	m_{pg}	Nova	plate series	J.D. 2400000+	m_{pg}
EY Aql	MF	24761.	10.9	MT Cen	MF	26485.3	12.2
"	MF	24790.	12.6	"	MF	26529.2	11.7
BC Cas	AC	25811.	ft12.	"	MF	26530.2	11.8
"	AC	25825.	10.7	"	MF	26738.5	14.7
"	AC	25853.	11.5	V745 Sco	B	28645.6	ft14.5
"	AC	25856.	ft12.	"	B	28664.6	11.0
"	AC	25872.	11.7 *	"	B	28668.6	12.45
"	I	25922.	14.0 **	"	B	28670.5	13.0
MT Cen	MF	26454.3	ft16.2	"	B	28672.5	13.25
"	MF	26470.3	14.7:	"	B	28673.6	13.3
"	MF	26474.3	8.35	"	B	28674.6	13.4:
"	MF	26481.3	10.0	"	B	28675.6	13.9:
				"	MF	28688.5	14.6:
				"	MF	28696.5	ft14.5

* poor plate; defect?
**very good image

1. EY Aql (1926)

This nova was discovered by Albitzky (1929) on Simeis plates; it is seen on 5 plates between 1926 September 8 and September 30, it does not appear on a plate taken 1926 August 16 (fainter than $13^{m}.6$). Hoffleit (1932) mentions that the nova was found only on two out of 79 Harvard plates, "during the interval of Albitzky's observations". It is indeed seen on two plates of the MF series, taken 1926 September 2 and October 1. The outburst time and the light curve form can be improved. The magnitude scale by Albitzky (1929) is used. The magnitude at maximum was brighter than $11^{m}.0$, the t_3-time about 40 days. The estimates are given in Table I, and the improved light curve is shown in Fig. 1.

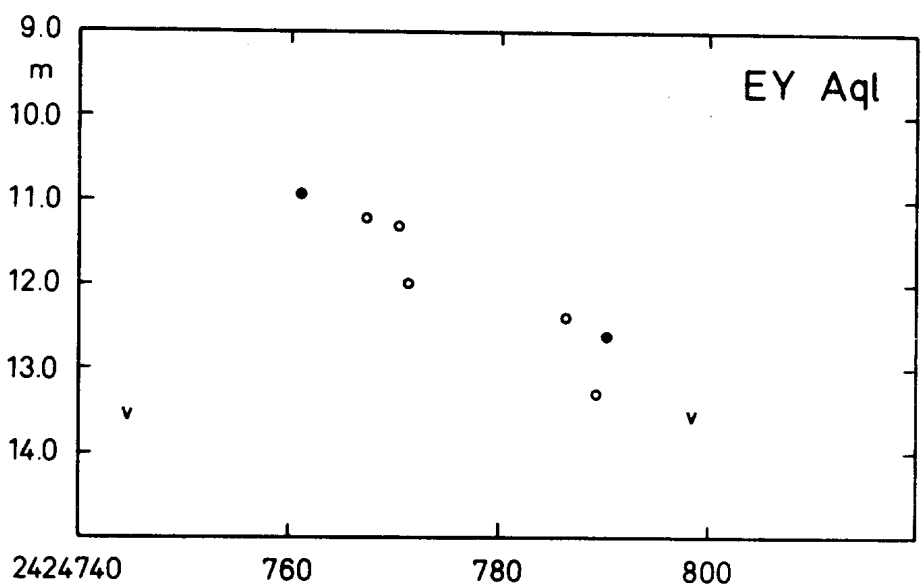

Fig. 1. The light curve of EY Aql (1926). Circles are Albitzky's (1929) magnitudes, dots are magnitudes from Harvard photographs.

2. BC Cas (1929)

This nova was discovered by Beljawsky (1931). Perova and Sharov (1956) list the observations from Moscow (Sternberg) and Simeis plates. Their first plate showing the star was taken 1929 September 4. A Harvard plate shows the object already bright on 1929 July 31, while a plate taken July 18 does not show the star. The Harvard observations are listed in Table I. The improved light curve is shown in Fig. 2.

It cannot be decided whether the first Harvard plate was taken on the rising or on the declining branch of the light curve. The magnitude at maximum was certainly near 10^m, the t_3-time is between 50 and 75 days.

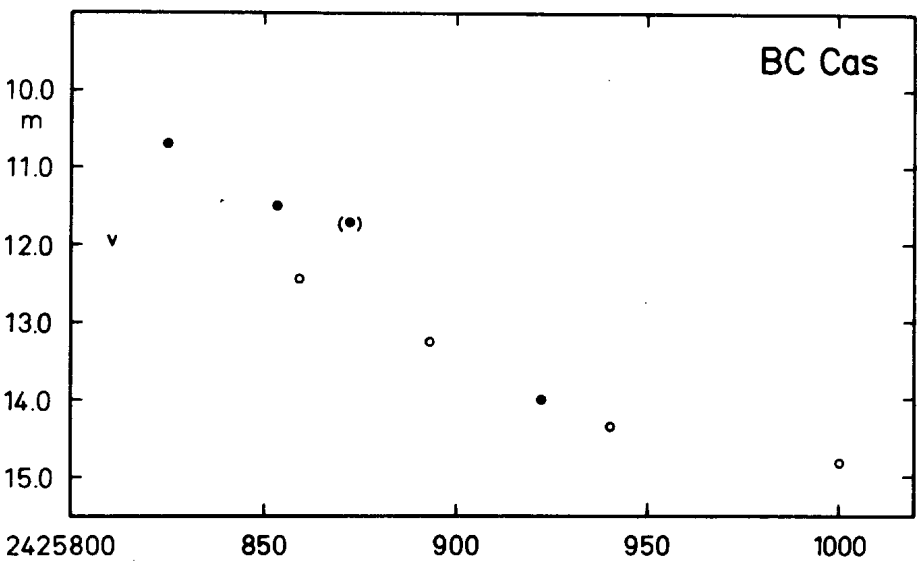

Fig. 2. The light curve of BC Cas (1929). Circles are magnitudes from Perova and Sharov (1956), dots are magnitudes from Harvard photographs.

3. MT Cen (1931)

This nova was discovered by Uitterdijk (1934) on plates taken in May, 1931. The rise to maximum is well covered with observations, however, 9 days after outburst, a gap of 411 days follows, after which the nova had disappeared. Some plates of the MF series show the nova. Uitterdijk's (1934) scale is used for the bright phase of the nova. For fainter phases, a scale was established and calibrated from an ESO/SRC J atlas plate, using King et al.'s (1981) magnitude - image diameter calibration.

The first Harvard plate shows the nova on the rising branch, more than 6^m below maximum. The magnitude at maximum is $8^m.35$, the t_3-time is about 10 days. Unfortunately, too few observations are available to classify the light curve. It may be a fast nova of the FH Ser type (Duerbeck's (1981) class Cb). The observations are listed in Table I, the light curve is shown in Fig. 3.

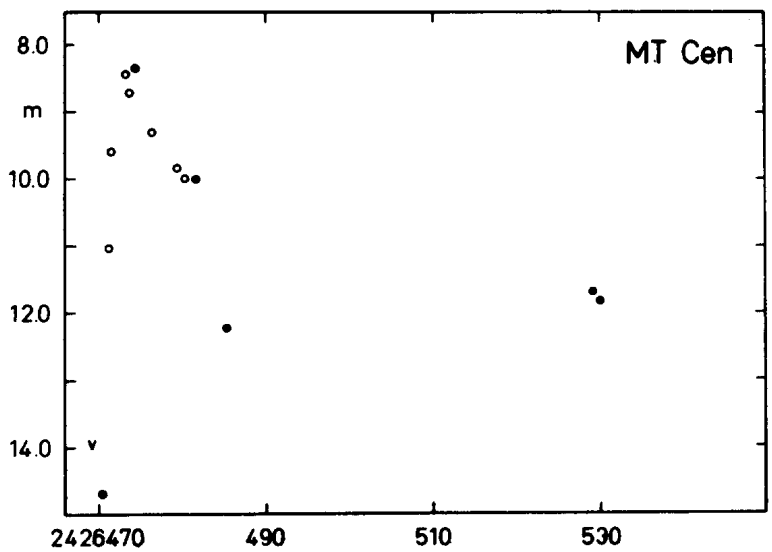

Fig. 3. The light curve of MT Cen (1931). Circles are Uitterdijk's (1934) magnitudes, dots are magnitudes from Harvard photographs.

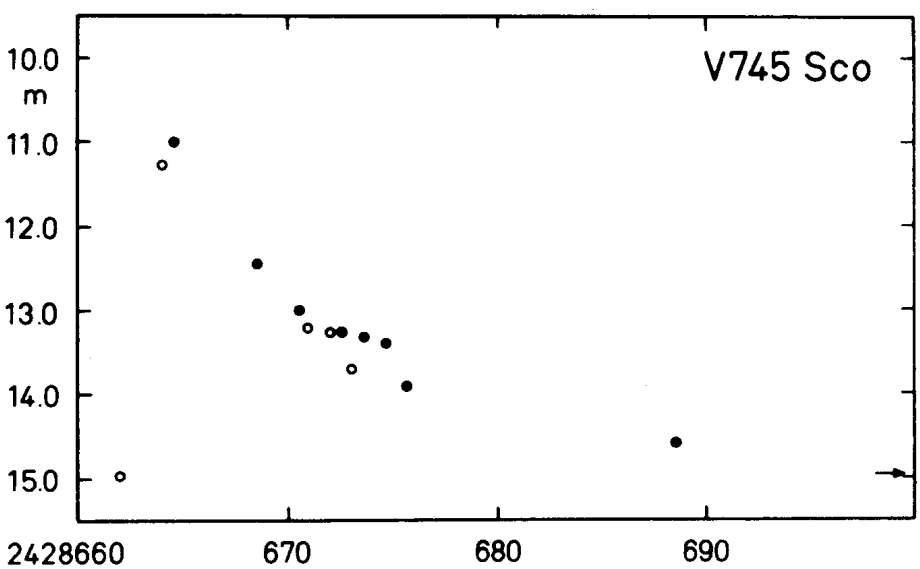

Fig. 4. The light curve of V745 Sco (1937). Circles are Plaut's (1956) magnitudes, dots are magnitudes from Harvard photographs.

4. V745 Sco (1937)

This nova was discovered by Plaut (1958) on plates taken by H. van Gent. It is visible on some B and MF plates. Plaut's (1958) scale is used. The maximum magnitude is $11^{m}.0$, the t_3-time is 12 days. The observations are given in Table I, the light curve is shown in Fig. 4.

Finding charts and accurate positions of the novae will be given in the forthcoming catalogue.

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