LIGHT VARIABILITY OF NOVA DELPHINI 1967 IN 1981 AND 1982

Nova Delphini 1967 (=HR Del) has been monitored on three
nights in 1981 (9.6 hours) and on three nights in 1982 (10.8
hours) at the Hamburg Observatory in Bergedorf. We used the
1.2 m (f/13) Ritchey–Chrétien telescope equipped with the
pulse counting photometer – polarimeter (RCA C 31034 photo-
multiplier; Schröder, 1978) and integrated for about 40 sec
in an instrumental system close to the Johnson V-band (Schott
2 mm GG 495 + 1 mm VG 6 + 2 mm BG 38). Comparison star No.6 (Barnes,
Evans, 1970) was adopted as local standard and served also
for determining the extinction.

Similar to our observations made in 1977–1980 (Kohoutek,
Pauls, 1980; Kohoutek et al.,1981) the brightness variations
were approximated by a one-cycle sinusoid. The times of five
maxima were derived (Table I) from the light curves observed
on five nights, whereas only a decrease in brightness was
observed on 1981 Aug. 28/29.

Table I

Journal of observations and maxima of the light curve.

Date 1981–1982	Period (UT)	Number of obs.	T(MAX) $JD_\odot$ 2440000 +
1981 Aug. 28/29	21:39 – 00:48	16	--
Sep. 24/25	20:21 – 23:09	19	4872.342
Sep. 30/Oct.1	18:59 – 22:40	36	4878.371
1982 July 21/22	23:04 – 01:37	30	5172.489
July 27/28	21:38 – 01:38	46	5178.440
July 28/29	21:30 – 01:42	56	5179.502

Combining the maxima of the nights 1982 July 27/28 and July 28/29 the following periods were found in the range of $0^{d}.14 - 0^{d}.27$ corresponding to E = 7,6,5,4 : $0^{d}.1524$, $0^{d}.1778$, $0^{d}.2134$, $0^{d}.2668$. We eliminated the shortest period by monitoring the nova for about 4 hours during some nights. Then we used the times of the three maxima observed in 1982 (Table I) and searched for elements of the light curve close to the remaining three possible periods given above. We derived the following periods: $0^{d}.17981$, $0^{d}.21231$, $0^{d}.26972$.
$$\pm 29 \qquad \pm 16 \qquad \pm 43$$

Our best fit, $0^{d}.21231$, is close to the possible periods $0^{d}.2159$ (found in 1977), $0^{d}.2167$ (1979) and $0^{d}.2201$ (1980) and it does not differ very much from the best solution $0^{d}.21417$ found recently from the RV-data by Bruch (1982).
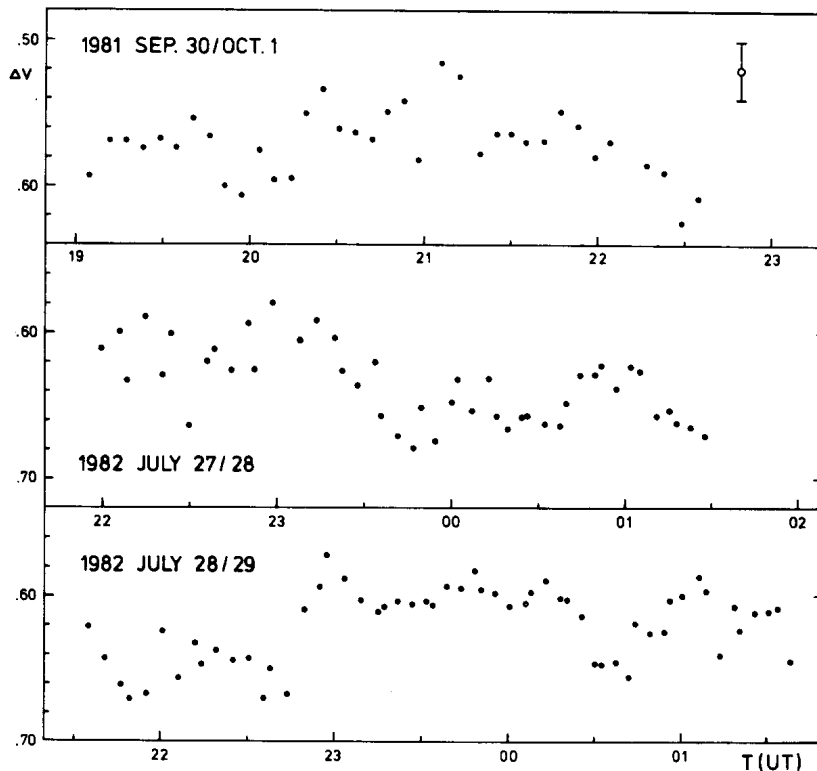

Figure 1

The light curve of N Del 1967 on three nights in 1981 and 1982; $\Delta v = v(Nova) - v(Comp.6)$.

As to the observations made in 1981 only two maxima are available (the time of the first maximum being uncertain). There exists a possible period $0^d.2149$ close to our best 1982 fit.

The decrease of the semi‑amplitude of the light curve (see Kohoutek et al., 1981) has continued. In 1981 and 1982 we measured $A_v = 0.029$ mag and 0.025 mag, respectively. With respect to the mean internal accuracy of one measure‑ment of the nova (± 0.02 mag), the approximation of the light curve by a sinusoid of such small amplitude is not very reliable (see Fig.1).

The brightness of Nova Del 1967 still seems to drop very slightly: we observed $\Delta v = v(\text{Nova}) - v(\text{Comp.6})$ to be $+0.57$ mag in 1981, and $+0.63$ mag in 1982.

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