THE OPTICAL POLARIZATION OF NOVA Del 1967

From Aug.2, 1967 to Nov.20, 1967 the optical polar-
ization of Nova Delphini 1967 has been observed. The ob-
servations have been carried out with the Zeiss refractor
65/1055 cm of Belgrade Astronomical Observatory. The photo-
electric polarimeter (Oskanjan et al.,1969) without filters
and slightly modified has been used.
     The observed degree of polarization in percents, P,
and the position angle of the plane of vibration, θ, of the
Nova are shown in Table I and in Figure 1. The lowest curve
in the same Figure represents the amount of polarization of
the comparison star BD +19°4484. All individual measure-
ments have been obtained by one-minute integration of the
observed polarimetric signal.

Table I

Date		JD 24397	p%	θ°
1967				
VIII.	2	705.500	1.13	20
	5	708.504	1.60	49
	8	711.560	1.49	28
	10	713.438	1.45	25
IX.	4	738.307	1.04	24
	6	740.299	1.03	34
	24	758.357	0.92	29
	26	760.378	1.17	20
	30	764.356	0.89	24
X.	6	770.256	1.10	10
	12	776.322	1.97	31
	20	784.281	1.51	36
	22	786.396	1.63	31
	24	788.340	1.85	40
	26	790.319	1.66	24
XI.	2	797.219	2.81	32
	14	809.252	1.93	29
	18	813.219	1.18	11
	20	815.250	1.50	27
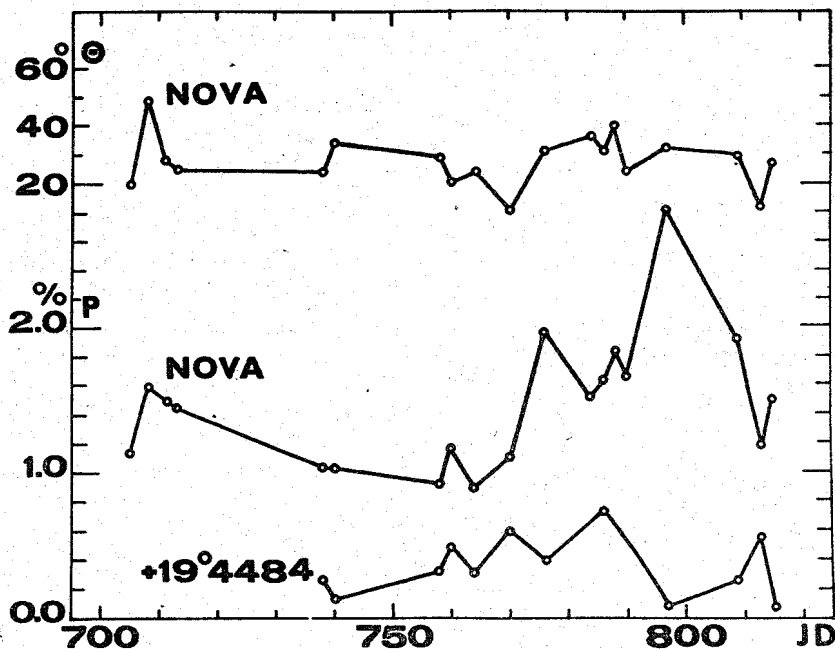
The r.m.s. error of a single measurement in the case of the comparison star amounts to ±0.34 %. Taking into account the brightness difference between Nova and the 6th magnitude comparison star, we can ascribe the same value as an upper limit of the error to the observations of the Nova. On the other hand, the r.m.s. error of one-minute single measurements of the position angle of the plane of vibration of a 1 % polarized 6th magnitude standard star amounts to ±13°. A similar scatter about the mean value of θ_m = 28° in the case of the Nova can also be noticed.

The degree of polarization of the Nova from Aug.2 to Oct.6, was lower than 1.5 %, and from Oct.6 to Nov.14, was higher than 1.5 % with an increase to 2.8 % on Nov.2. It was noticed that seven from nine values of P higher than the average appeared simultaneously with the θ values higher than the average. However, the correlation coefficient amounting to +0.42 does not confirm any linear correlation between P and θ. Nevertheless the observed time variation of polarization is in accordance with H.D.Morrison and W.Liller's (1968) measurements and seems to be real.

The observed plane of vibration of the electrical vector is parallel to the galactic equator what could suggest the interstellar origin of the observed polarization, or at least, a considerable interstellar component in it. But Hutchings' (1969) statement that the Nova is closer than 400 pc agrees well with Zellner's (1969) conclusion, based on the observed untypical wavelength dependence of P, that the Nova's polarization can not be of interstellar origin. Furthermore, according to the rather scarce polarimetric observation of the field stars (available data only for HD 196035 and HD 196775, Hall 1958) the interstellar contribution to the observed polarization is probably not higher than $P_M = 0.4$ % in the direction $\Theta = 7°$.

As more definite conclusion on the interstellar polarization is impossible without some more data on the closer field stars and a more certain estimation of the distance of Nova, at this stage one should take the observed polarization as mainly intrinsic.

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