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uvby OBSERVATIONS OF V471 Tau IN OCTOBER 1981\*

The red dwarf - white dwarf binary V471 Tau is for many reasons one of the most interesting close binaries. One of the aspects is the spot activity of the K2V component due to the fast, orbitally synchronized rotation ( $P=0.521$  d). The time scale of spot re-arrangements on this star is very short, of the order of days, as documented in a number of studies, e.g. in the 1976 uvby photometry on 9 consecutive nights by Rucinski (1981).

Here, new uvby observations obtained also on 9 consecutive nights of the last decade of October 1981 are presented. They have been collected with the simultaneous four-colour photometer on the 50 cm Danish telescope in ESO, La Silla, Chile (Grønbech *et al.* 1976). Up to 40 standard stars were observed each night and the following data for the comparison star HD 24040 have been obtained from 9 independent tie-ins to the standard system:  $V = 7.508 \pm 0.002$ ,  $(b-y) = 0.412 \pm 0.001$ ,  $m_1 = 0.221 \pm 0.001$ ,  $c_1 = 0.380 \pm 0.002$ . These values differ slightly from those given in Rucinski (1981) and are probably of a higher quality than the previous data.

The differential observations of V471 Tau are listed in Table I and are plotted in Fig. 1 together with the 1976 light curve. The observations were obtained normally only once per night, at culminations through air-masses about 1.47. The time in Table I is expressed in heliocentric modified Julian Days (MJD = JD - 2 400 000.5); the phases have been computed from the ephemeris of Oliver and Rucinski (1978) for the segment C of their (O-C) diagram:  
MJD 40609.56642 + 0.52118294 E.

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\* Based on observations obtained at the European Southern Observatory, La Silla, Chile.

Table I

Differential observations of V471 Tau  
(relative HD 24040)

MJD (hel)	Phase	$\Delta V$	$\Delta(b-y)$	$\Delta m_1$	$\Delta c_1$
44898.235	0.721	1.924	0.116	0.099	-0.271
.300	.844	1.941	0.108	0.121	-0.292
44899.278	.721	1.929	0.097	0.125	-0.240
44900.248	.582	1.965	0.117	0.093	-0.289
44901.250	.506	1.966	0.118	0.101	-0.315
44905.203	.088	1.961	0.102	0.113	-0.254
.282	.241	1.941	0.113	0.105	-0.294
44906.231	.063	1.953	0.108	0.117	-0.271
44907.254	.024	1.973	0.118	0.120	-0.164
44908.255	.946	1.946	0.112	0.097	-0.248
44909.253	0.861	1.944	0.112	0.108	-0.257

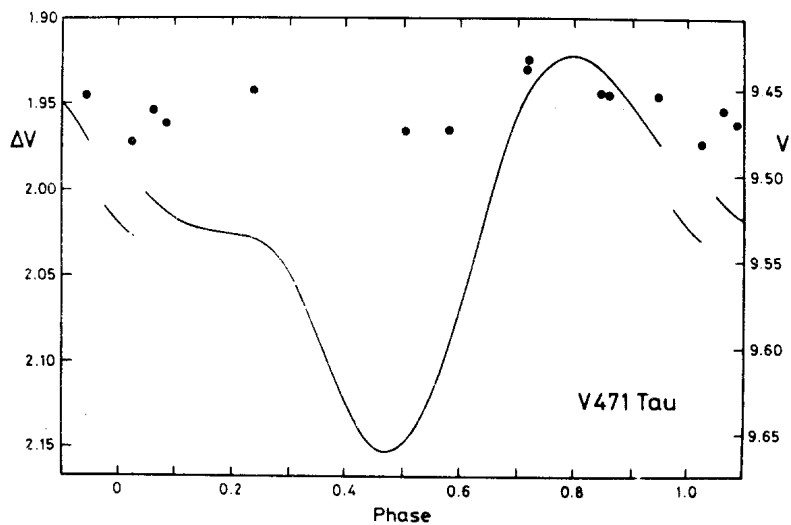


Fig.1 The October 1981 observations of V471 Tau plotted on the phase diagram together with the 1976 light curve.

The new observations indicate that the variability of V471 Tau almost disappeared in October 1981 with the brightness level ( $\Delta V = 1.95$ ) stabilized close to the maximum brightness observed in 1976 at phase 0.81 ( $\Delta V = 1.92$ ). The mean differential indices (all observations outside eclipse):  $\Delta(b-y) = 0.110 \pm 0.002$ ,  $\Delta m_1 = 0.108 \pm 0.003$ ,  $\Delta c_1 = -0.273 \pm 0.008$  were also close to those observed at the light maximum in 1976:  $\Delta(b-y) = 0.108$ ,  $\Delta m_1 = 0.110$ ,  $\Delta c_1 = -0.288$  but differed from those at the light minimum in 1976 at phase 0.5:  $\Delta(b-y) = 0.135$ ,  $\Delta m_1 = 0.095$ ,  $\Delta c_1 = -0.360$ . This sheds new light on the unexplained peculiarity of colours at light minimum noticed previously and suggests that this peculiarity was not caused by the reflection effect of the white dwarf light.

These observations have been collected at ESO, La Silla during my association with the Max-Planck-Institut für Astrophysik, Munich; I am grateful to the Directors of the Institute for extending its excellent facilities to me.

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