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UBV OBSERVATIONS AND A PHOTOMETRIC SEQUENCE FOR THE HIGHLY ACTIVE T TAURI STAR VY TAU

VY Tau (1900: $\alpha = 4^h33.3^m$; $\delta = +22^\circ36'$) is nearly unique among the T Tauri stars for the great range of its brightness variations. The star is of extraordinary interest because Herbig (1977) has raised the possibility that this star may provide an evolutionary link between FU Orionis objects and main sequence stars. Therefore, a photometric sequence in its vicinity is desirable to improve the accuracy of photographic light curves. In addition to data for the sequence stars, a few photoelectric observations of VY Tau are presented.

All observations were made at Lick Observatory, Mt. Hamilton, California. The first four observations of VY Tau were made with the 0.6 meter reflector, a dry-ice cooled 1P21 and a DC amplifier feeding a chart recorder. All other observations were made with pulse counting dual-channel dry-ice cooled FW-129 (S-11) photomultipliers at the 0.9 meter Crossley telescope.

The results are presented in Table I, and the stars are identified in the figure (North at the top, East to the left). The errors given in parentheses in the Table are standard deviations of the mean in hundredths of a mag, as determined from agreement between the independent channels and between nights. An error of 0 means the calculated error was less than 0.005 mag. Estimated errors for the nights when VY Tau was observed with DC equipment are 0.02 mag for V, 0.01 mag for B-V and 0.03 mag in U-B.

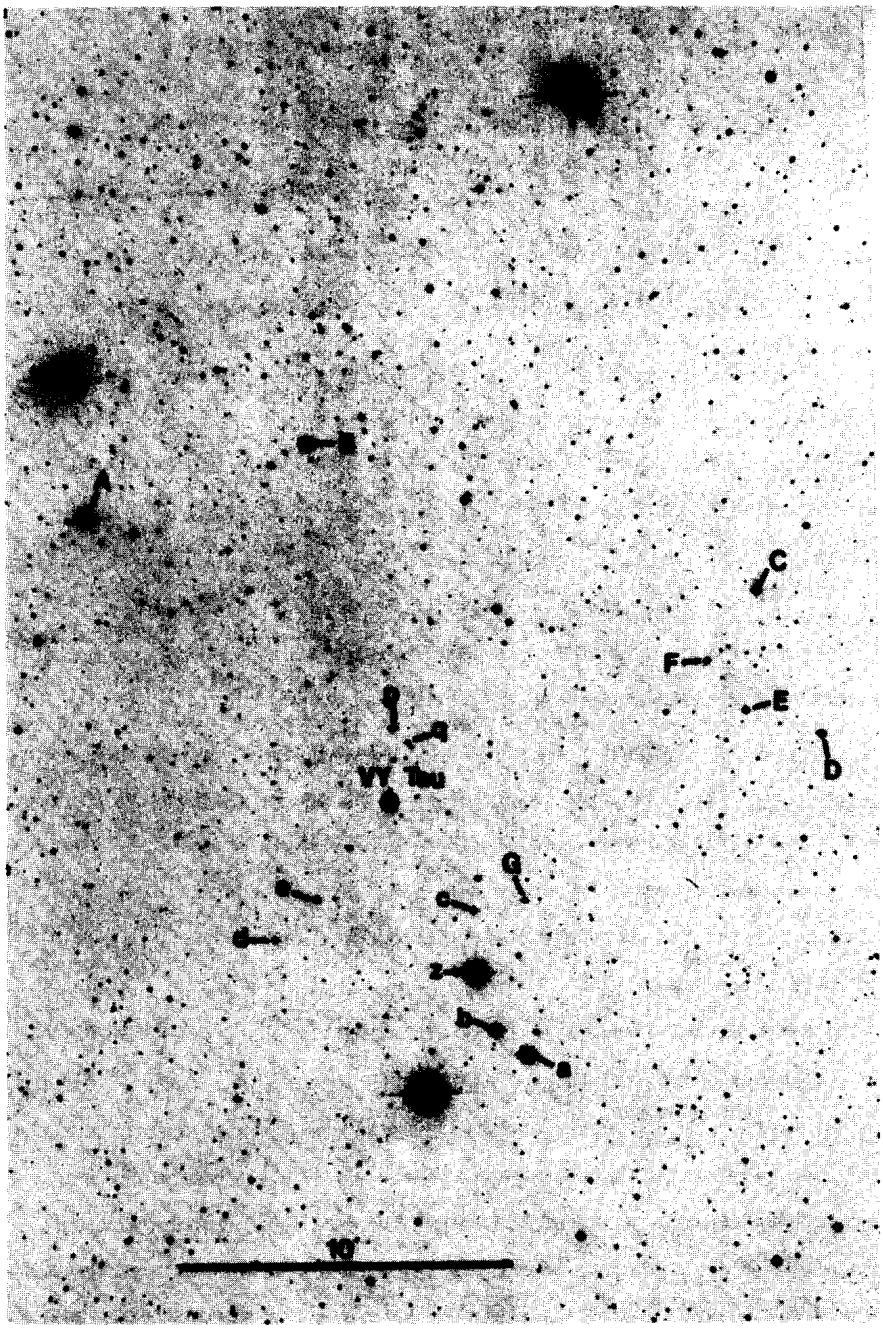

Figure 1 VY Tau and Environs

Table I

VY Tau: Photometry and a Photometric Sequence

Star	JD244+	V	B-V	U-B
VY Tau	1571.988	13.40	1.14	0.10
	1572.941	13.48	1.05	-0.02
	1665.722	13.62	1.30	--
	1665.893	13.61	1.35	--
	2797.---	13.68(1)	1.45(0)	--
	4877.979	13.63(2)	1.53(3)	--
	4909.955	13.38(1)	1.47(0)	--
a	----	10.57(1)	0.37(1)	--
b	----	11.24(1)	0.62(1)	--
c	----	11.53(1)	2.09(3)	--
d	----	13.31(1)	0.99(2)	--
e	----	13.70(1)	0.85(3)	--
p	----	14.04(0)	0.76(4)	--
q	----	14.32(6)	0.92(9)	--
z	----	10.04(0)	0.26(1)	-0.20(1)
A	----	10.29(1)	0.74(1)	0.37(1)
B	----	11.21(1)	0.75(1)	0.15(1)
C	----	11.95(1)	0.68(0)	0.36(1)
D	----	12.35(1)	0.87(1)	0.35(2)
E	----	12.58(1)	0.88(1)	0.41(3)
F	----	13.12(2)	0.86(2)	0.23(3)
G	----	13.36(1)	0.93(2)	0.23(3)

Meinunger (1969, 1971, 1980) has shown that periods of activity are irregularly interrupted by relatively quiescent periods which may last over a decade. It's unfortunate that the present observations fall entirely within such an extended period of inactivity (cf. Meinunger 1980). The observations are few and one should be skeptical of attributing too much significance to it, but there is the suggestion from the B-V colors that the star has reddened by about 0.4 mag over the nine years covered by the observations.

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