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A NEWLY DISCOVERED BY Dra-TYPE STAR: HD 134319

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HD 134319 (G5V; V $\simeq$ +8.42 mag; B−V = +0.68) is a main-sequence G-type star with very strong chromospheric line emissions, most likely arising from strong magnetic activity (Soderblom 1985). High precision radial velocity measures carried out in the CORAVEL program show HD 134319 to have a constant radial velocity $V_r = -6.38 \pm 0.17$ km s^{-1}, indicating that HD 134319 is unlikely a member of a close binary system (Duquennoy et al., 1991). Its U, V, W space velocity components (39, −17, 2 km s^{-1}) are very close to those of the Hyades star cluster (40, −18, −2 km s^{-1}) (Eggen, 1960). This indicates that it is a probable member of the Hyades moving group with an age of about 625 Myr (Perryman et al., 1998).

The photoelectric photometry reported in this paper has been obtained in 1991 with an automatic photometric telescope (APT, see Boyd & Genet 1986) on Mt. Hopkins (AZ/USA): the 0.75m Four Colleges Consortium APT.

The differential photometry of HD 134319 was made in the *u, v, b* and *y* filters matching the Strömgren system (Strömgren, 1966) and using HD 134851 (K0V; V = +7.1 mag; B−V = +0.90) as the comparison star and HD 138852 (K0III-IV; V = +5.79 mag; B−V = +1.96) as the check star. Ten second integrations were used in each filter and the usual observing sequence of sky-comparison-check-variable-comparison-sky was employed. The measures were corrected for the effects of the atmospheric extinction. No significant light variation was detected from the differential measures of the comparison and check stars, indicating that the light of the comparison stars is constant, within about ± 0.015 mag. Normal points were computed by averaging the observations obtained on each night. The typical standard deviations of the averaged data points are of the order of 0.008 mag in *y* and *b* filters and 0.012 mag in the *v* and *u* filters, because of the lower signal/noise ratio at shorter wavelengths in late-type stars.

The full set of photometric data was analysed using a Scargle-Press period search routine (Scargle, 1982) and a photometric period P = 4.448 ± 0.01 was found. Since the optical flux of HD 134319 changes in amplitude and shape over a scale time of few rotation periods, it proved possible to select two data sets, along which the flux modulation resulted to be rather stable.

Fig. 1 shows the *y*-band, $b-y$, m_1 and c_1 light curves for the mean epochs 1991.18 and 1991.28, respectively. Phases are reckoned from the first observed light curve minimum at HJD = 2448367.766 using the P=$4^{\rm d}.448$ rotation period.

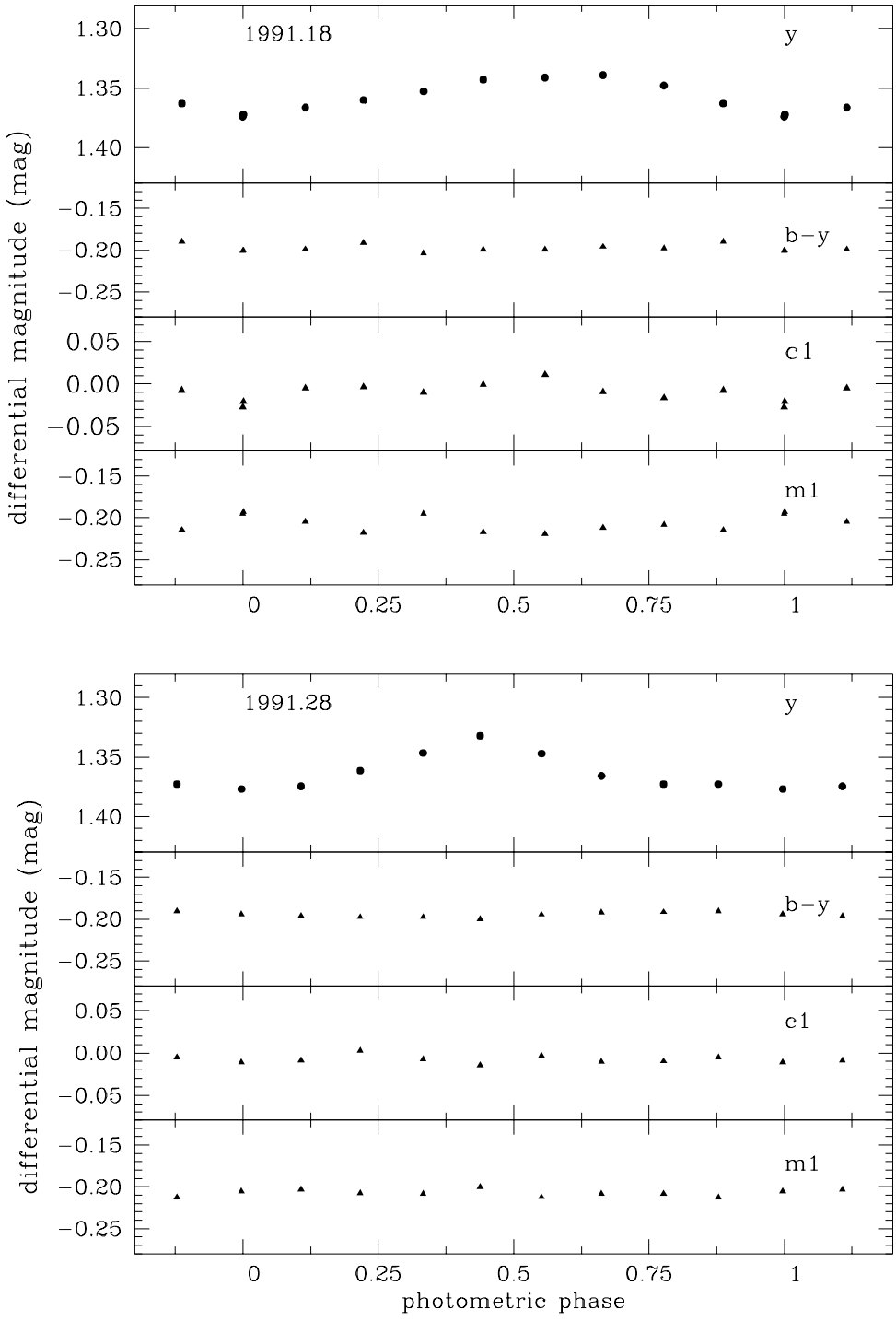

Figure 1. The y-band, $b-y$, c_1 and m_1 light curves of HD 134319 for the mean epoch 1991.18 (*top*) and 1991.28 (*bottom*). Phases are reckoned from the first observed light curve minimum at HJD = 2448367.766 using the $4^{\rm d}.448$ photometric period

Table 1: Mean epochs, number of observing nights, mean differential magnitudes and peak-to-peak amplitude of the light curves of HD 134319 (subscripts v and c denote variable and comparison stars, respectively).

Mean Epoch	# of nights	$\langle u_v - u_c \rangle$ (mag)	Δu (mag)	$\langle v_v - v_c \rangle$ (mag)	Δv (mag)	$\langle b_v - b_c \rangle$ (mag)	Δb (mag)	$\langle y_v - y_c \rangle$ (mag)	Δy (mag)
1991.18	14	0.34	0.06	0.75	0.05	1.14	0.03	1.36	0.03
1991.28	17	0.35	0.06	0.76	0.04	1.17	0.05	1.36	0.04

The $4\overset{\mathrm{d}}{.}448$ continuum flux modulation is interpreted as arising from the presence of dark starspots, unevenly distributed on the stellar photosphere, whose visibility is modulated by the stellar rotation.

The wavelength dependence shown by the light curves of HD 134319, whose peak-to-peak amplitude increases towards decreasing wavelengths (see Table 1), can be accounted for by the presence of spots cooler than the surrounding photosphere.

Singularity, youth and high level of chromospheric and photospheric magnetic activity make this newly discovered BY Dra-type star a proxy for the young Sun and, therefore, of interest for studying the magnetic activity of the young Sun.

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