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PHOTOMETRIC VARIABILITY OF THE SILICON Ap-STAR HD 43819 +)

In a larger photometric program of Ap stars I have included the object HD 43819 (=HR 2258) classified B9 IIIp Si, (Cr) by Cowley (1972) in order to look for possible photometric variability. The measurements were carried out at the ESO 1 m photometric telescope on La Silla (Chile) using a dry ice cooled EMI 6256 photomultiplier and a pulse counting device for the Strömgren and g_1g_2 (Maitzen, 1976) filter measurements. The latter were introduced for measuring the $\lambda 5200$ flux depression of Ap stars.

HD 43819 was measured against the comparison star HD 42784. The mean colours of both stars as derived from my absolute photometry are:

	b-y	m_1	c_1	Δa
HD 43819	-.053	.137	.744	.042
HD 42784	-.036	.099	.574	.000

The Δa-parameter (which is a measure of the presence of the $\lambda 5200$-depression as defined by Maitzen, 1976) of HD 43819 indicates a rather pronounced Ap characteristic, while the comparison star shows up as a normal late B type star using this criterion.

The absolute colours b-y and Δa are slightly variable for HD 43819 with amplitudes of about 0.01 mag. They vary in phase: the bluer b-y, the stronger the Δa-excess.

Based on the foregoing there seems to be sufficient evidence that the variations displayed in Fig. 1 are caused by a photometric variability of the Ap star HD 43819. Moreover, the wavelength dependence of the amplitude is typical for a Silicon star - it decreases from u (0.04) to y (0.01). No final determination of

+) Based on measurements collected at the European Southern Observatory (ESO), La Silla - Chile.

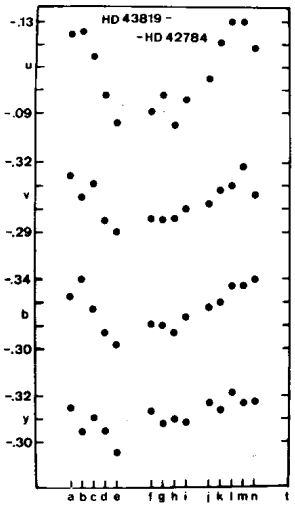

Figure 1. Differential Strömgren photometry HD 43819 minus HD 42784. The precise time abscissae values are:

a=	JD 2441721.586	h=	JD 2441730.530
b=	22.588	i=	31.525
c=	23.612	j=	33.557
d=	24.551	k=	34.547
e=	25.558	l=	35.545
f=	28.534	m=	36.554
g=	29.541	n=	37.542

the period of the variations can be obtained from this data, because the observational test for variability of the order of 1 day, i.e. observations well displaced over the night, could not be performed due to the northern position of the stars.

The quicklook 14 days period as indicated by the run of the differential photometry in Fig. 1 would be unusually large for an early type Ap star. It can be safely ruled out, however, by its published rotational velocity v_e sin i = 55 km/s according to the catalog of Uesugi and Fukuda (1970). Such a fast rotation would imply an impossible minimum radius of about 15 solar radii for this star. Thus, the correct period will have to be found among the related periods: $\pm 1/P = \pm n + 1/14$.

This points rather to 0.93 or 1.077 days than to 0.48 or 0.52 days because the latter would require a nearly pole-on aspect ($i=10^{\circ}$ for a 3 solar radii star) restricting strongly the observable variability.

In conclusion, future observers should concentrate their efforts to monitor the photometric variability of HD 43819 from a more northern observatory throughout the night in order to find the final period of this Silicon star.

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