

COMMISSION 27 OF THE I. A. U.  
INFORMATION BULLETIN ON VARIABLE STARS

Number 3542

Konkoly Observatory  
Budapest  
16 November 1990  
HU ISSN 0374 - 0676

**HD20629: an X-ray selected optically variable Ap star (\*)**

HD20629 (=SAO93386=BD+18<sup>0</sup>459=GC 3971) is a suspected chemically peculiar (CP) star (Renson et al., 1990) that has been identified as the optical counterpart of the serendipitous X-ray source EXO 031656+1853.4. It has been observed during a program of systematic photometric and spectroscopic studies of stars discovered in EXOSAT X-ray images (Giommi et al., 1988; Cutispoto et al., 1990).

Single dwarf stars in the range B7-A5 are probably not X-ray emitters at levels greater than  $10^{27}$  erg/s (Rosner et al., 1985) with the exception of some CP stars (Cash and Snow, 1982). Considering a value for the interstellar reddening  $A_V$  between 0 and 2 magnitudes, we obtain a distance for HD20629 ranging from about 240 to 100 pc, respectively. Assuming an optically thin line and continuum model for a solar abundance plasma in collisional equilibrium (Mewe et al., 1985) the X-ray luminosity of HD20629 is in the range  $10^{29.9} + 10^{31.5}$  erg s<sup>-1</sup>, according to the assumed values for distance and absorption. These values are very high, suggesting either that the CP star is a real strong X-ray emitter or that the emission comes from a chromospherically active late-type companion.

Here we present the first results of spectroscopic and photometric observations obtained at the European Southern Observatory (La Silla, Chile).

Moderate resolution spectra both in the H $\alpha$  and Ca II H and K regions have been obtained at the 1.52m ESO telescope. High resolution spectra of the Ca II H and Li I (6707 Å) lines have been obtained at the CES fed by the 1.4m CAT telescope. Several metal lines are present in these spectra. For instance in the region 4000-4300 Å the Sr II (4078 Å), Si II (4128-31 Å), Fe II

(\*) based on data collected with the ESA X-ray Observatory EXOSAT and at the European Southern Observatory, La Silla, Chile.

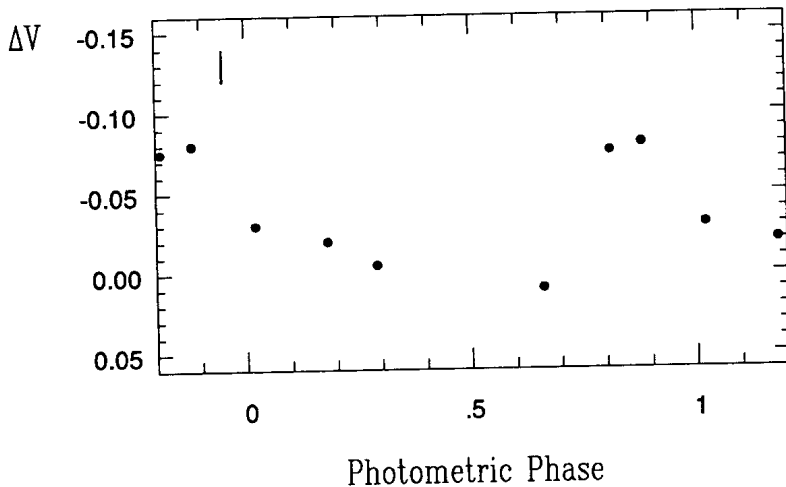


Figure 1) V light curve of HD20629. Phases are computed with the ephemeris  $HJD = 2448165.0 + 4.7 \times E$ . The vertical bar shows the expected maximum error. Observations are in the instrumental system.

+ Ti II (4172-3, 4179 Å), Si II (4198 Å), Cr II (4207 Å), Cr II + Fe II (4233 + 4253 Å) lines are clearly detected, and the most appropriate spectral classification of HD20629 seems to be A0SiSrCr. No evidence for duplicity has been found.

Photometry has been obtained over the period 30 September - 11 October 1990 using the 1.0m ESO telescope feeding a single-channel photon-counting photometer equipped with a thermoelectrically cooled RCA 31034 GaAs photomultiplier tube. HD20512 and HD20278 were chosen as comparison and check star, respectively, and did not show variability. The instrumental differential V light curve, in the sense HD20629 minus HD20512 corrected for atmospheric extinction, is shown in Figure 1.

HD20629 is clearly variable, with a period of 4.7 days. This value, that has to be considered as preliminary, is well in agreement with HD20629 being a CP of the SiSrCr subgroup (Catalano et al., 1990). The amplitude of the V variability, about 0.09 magnitudes, is also outstanding.

Further photometric and spectroscopic observations are

planned in the near future in order to obtain a more complete study of this interesting object.

G. CUTISPOTO <sup>(1)</sup>, G. TAGLIAFERRI <sup>(2)</sup>, F.A. CATALANO <sup>(3)</sup>

- (1) Osservatorio Astrofisico di Catania, v.le A.Doria, 6 I-95125 Catania, Italy
- (2) EXOSAT Observatory, SSD-ESTEC, Keplerlaan 1, 2200 AG, Noordwijk, The Netherlands
- (3) Istituto di Astronomia, Università di Catania, v.le A. Doria, 6 I-95125 Catania, Italy

#### REFERENCES

- Cash, W., Snow, T.P.: 1982, *Astrophys.J.* **263**, L59
- Catalano, F.A., Renson, P., Leone, F.: 1990, *in progress*
- Cutispoto, G., Tagliaferri, G., Giommi, P., Gouiffers, C., Pallavicini, R., Pasquini, L., Rodonó, M.: 1990, *Astron. Astrophys.Suppl.Ser.* *in press*
- Giommi, P., Tagliaferri, G., Angelini, L.: 1988, in "X-ray Astronomy with EXOSAT", R.Pallavicini and N.E.White (eds), *Mem.Soc.Astron.Ital.* **59**, 33
- Mewe, R., Gronesechild, E.H., van den Oort, G.H.: 1985, *Astron. Astrophys.Suppl.Ser.*, **62**, 197
- Renson, P., Gerbaldi, M., Catalano, F.A.: 1990, *Astron. Astrophys.Suppl.Ser.*, *submitted*
- Rosner, R., Golub, L., Vaiana, G.S.: 1985, *Ann.Rev.Astron. Astrophys.* **23**, 413