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ARE THE ALGOL-TYPE STARS V438 CENTAURI, V1156 CYGNI, AND V929 OPHIUCHI SURROUNDED BY ACCRETION DISCS? - A CALL FOR OBSERVATIONS

In a systematical search we looked for infrared excess radiation emitted from Algol-type variables. For this aim we compared the coordinates of such variables and infrared point sources contained in the catalogues compiled by Kholopov (1982, 1985, 1987) and Beichman et al. (1985). The coincidence of the coordinates within the individual error boxes given in the catalogues has been defined as a positive identification. The observed infrared fluxes in the IRAS 12, 25, 60, and 100 μm passbands have been converted into colour - corrected-ones assuming a power law correction (Beichman et al.,1985). From these values flux ratios F12/F25 and F25/F60 have been calculated. Their quantities cover a relatively large range.

Modelling X-ray binaries Smith et al. (1990) discussed the properties of accretion discs in such systems. In the frame of their assumptions these authors found that from the accretion discs infrared radiation can be emitted, too. Within certain limits the theoretically calculated flux ratios obey a relation $\ln(F12/F25) \sim \ln(F25/F60)$. In a corresponding diagram altogether 56 of the selected infrared sources possessing values $\ln(F12/F25)$ and $\ln(F25/F60).> -1$ are distributed near the theoretical relation. Three of them V438 Cen, V1156 Cyg, and V929 Oph (listed in Table 1) match the theoretical relation within the error boxes arising from the uncertainties of the measured infrared fluxes. Above all we would turn to the presentation of the collected data for these three objects. Unfortunately, for these variables there is a lack of accurate photometric data in the optical as well as ultraviolet spectral region. Existing estimates of the magnitudes are based only on photographic plates (Table 1). Table 2 contains all relevant IRAS data concerning those objects which can be regarded as promising candidates possessing accretion discs.

Table I

Variable	Type of variability	Period (d)	Magnitude max	Magnitude min	Literature
V438 Cen	E ?	?	11.8	12.2	Erro (1940)
V1156 Cyg	EA/DM:	44.5647	13.5	14.3	Wachmann (1966)
V929 Oph	EA/SD:	2.3401	15.0	15.6	Götz and Wenzel (1956)

Table II

IRAS Data	V438 Cen	V1156 Cyg	V929 Oph
Flux density uncertainties (in units $\delta f_\nu / f_\nu$):			
12 μm	0.04 - 0.08	0.04 - 0.08	0.04 - 0.08
25 μm	0.04 - 0.08	0.08 - 0.12	0.04 - 0.08
60 μm	0.08 - 0.12	/	/
100 μm	/	/	/
Correlation coefficient for compact IR sources:			
12 μm	100	100	100
25 μm	100	100	100
60 μm	99	90	/
100 μm	/	99	/
Variability in 12, 25 μm passbands:	20 - 29 %	10 - 19 %	20 - 29 %
Confusion with other sources:			
C1	0	0	4
C2	5	8	5
PH	0	1	0
PW	0	0	0

C1: Number of point sources at 100 μm in 0.5°x0.5° around the IR source in question.

C2: Ratio of a 0.5° extended 100 μm emission to the source flux: C2 < 4 - no influence of Cirrus; C2 > 4 - influence of Cirrus not negligible.

PH, PW: Numbers of nearby hours-confirmed (PH), weeks-confirmed (PW) sources within a box 12'x 9'.

Moreover, we found in our search among others infrared point sources at the positions of the variables DX Aquarii and CI Cygni, too. In both cases the infrared flux ratios derived from observations deviate in the IR flux ratio diagram remarkably from the theoretical relation obtained by Smith et al. (1990). Never-

theless, these variables deserve further attention for the explanation of their infrared excesses.

For DX Aquarii (≡ BD −17° 6422 ≡ HD 209758) numerous photoelectric observations mainly in the UBV system and spectroscopic data exist. A comprehensive summary concerning the changing photometric behaviour of this variable has been given by Srivastava (1986). According to the IRAS data the coinciding IR source is pointlike. No information concerning its IR variability is given.

CI Cygni is a photometrically and spectroscopically well-studied object which belongs to the Algol symbiotics. Relevant observational data are cited in the summarizing papers by Mikolajewska (1985) and Mikolajewska and Mikolajewski (1988). From spectroscopic as well as photometric observations the existence of an accretion disc around the main sequence star has been inferred by Chochol et al. (1984). The existence of a 10 μm infrared excess has been attributed to the presence of an evolved red giant. According to IRAS data a pointlike IR source matches perfectly the position of CI Cygni. The IRAS fluxes show no sign of variability.

The attempt to identify all above mentioned variables with X-ray sources listed in different catalogues (Giacconi et al. 1972, 1974, Forman et al. 1978, Cooke et al. 1978, Marshall et al. 1979, Amnuel et al. 1979, Nugent et al. 1983, Levine et al. 1984, Wood et al. 1984) failed.

In case of V438 Cen, V1156 Cyg, and V929 Oph high quality photoelectric observations in as much as possible standard passbands are highly desired. Such a data base would be a useful tool for the detection of the presumed asymmetries and variations in the light curves arising from hot spots on those components surrounded by accretion discs.

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