

NEAR-IR OBSERVATIONS OF THE SSV 13, SSV 9, SSV 5 SOURCES IN NGC 1333

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ABSTRACT. The sources (1) SSV 13 (identified with the IRAS (2) source 03259+3105), SSV 9 (IRAS 03256+3107), SSV 5 (IRAS 03262+3108) were observed photometrically in the JHKL bands with the In-Sb photometer at the Italian IR Telescope (TIRGO, Gornergrat, Switzerland). In addition CVF spectrophotometry between 2.0 and 2.4 μm of SSV 13 was carried out. We present a study of the energy distribution between 1 and 100 μm , including both our photometry and IRAS data.

SSV 13

This is the exciting star (probably a T Tauri star) of the H-H 7-11 chain, well studied by Cohen and Schwartz (C-S) (3). The total energy distribution between 1 and 60 μm is reported in Fig. 1. A luminosity $L_{\text{IR}} \sim 87 L_{\odot}$ has been inferred for the source by integrating the whole energy distribution. This luminosity is larger than the bolometric luminosity found by C-S of about 29.8 L_{\odot} .

We derive a visual extinction $A_V = 43$ from the optical depth at 9.7 μm ($\tau_{9.7} \sim 2.7$) obtained from narrow-band photometry (3), using the relationship $A_V/\tau_{9.7} = 16$. No Br γ line emission at $\lambda = 2.167 \mu\text{m}$ is observed from the 2.0-2.4 μm spectrum, while the H₂ ($v = 1 - 0$) S(3) line is present (Fig. 2), in agreement with the extended emission of molecular hydrogen observed in the H-H 7-11 chain. The J and H fluxes observed with large diaphragm ($D = 27''$) appear to be greater than those observed with the 17'' diaphragm. This is probably due to contamination by a near optical star.

SSV 9

The source is associated with a visible and probably variable star. The star has been classified as K 7 (3) and is surrounded by an optical nebulosity. By comparing our photometry with that previously obtained (1), we derive a variation of about 1 mag in both H and K bands for this source. The near-IR colour cannot be explained simply by a reddened K 7 star: the observed colour index $K-L = 2.31$ implies the presence

of dust at a temperature T_C (K-L) ~ 950 K. The derived IR luminosity $L_{1-25} \sim 4 L_{\odot}$ agrees with the classification given for this star.

SSV 5

The source is associated with the Herbig-Haro object H-H 17. Our photometry gives a K band magnitude lower by 3-4 mag than the data of Strom et al. (1), suggesting the source might be variable. On the other hand, our photometry agrees with the IRAS data. We estimate L_{1-25} of order $1 L_{\odot}$; the source could be associated with a low-mass protostellar object in the region.

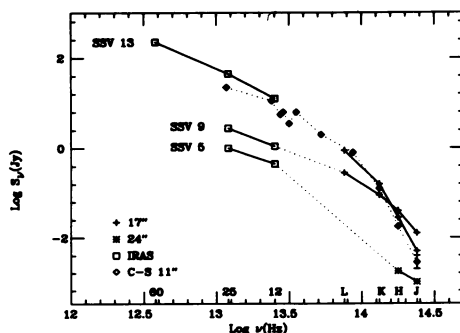


Fig. 1. Flux distribution of SSV 13, SSV 9, SSV 5. Our data are presented with those of IRAS and of Cohen and Schwartz (C-S).

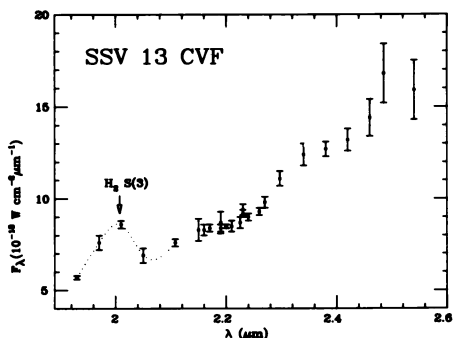


Fig. 2. CVF spectrophotometry in the K band region.

LITERATURE

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