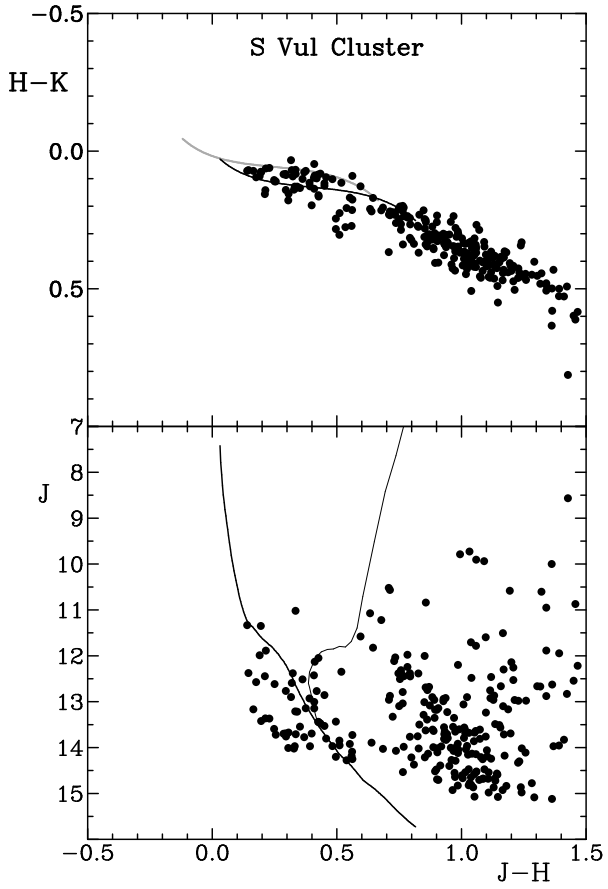

Fig. 6. JHK_s photometry for stars within $4'$ of the center of Turner 1 with magnitude uncertainties smaller than ±0.05. The intrinsic color-color relation is depicted in gray, while the intrinsic relations for $E(J–H) = 0.15$ ($E(B–V) = 0.51$) and $J–M_J = 9.7$ ($V_0–M_V = 9.34$) are shown as black lines. The thin black curve is an isochrone for $\log t = 9.8$ adapted from Meynet et al. (1993).

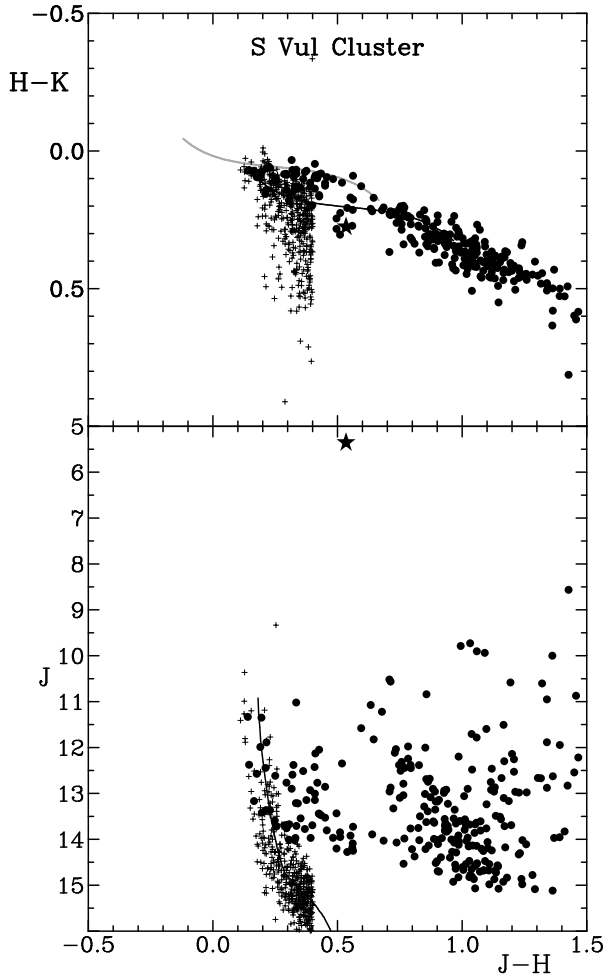

Fig. 7. The same as Figure 6 but for $E(J–H) = 0.29$ ($E(B–V) = 1.02$) and $J–M_J = 13.2$ ($V_0–M_V = 12.47$), shown as black lines. Small plus signs denote additional stars within $11'$ of the cluster center inferred to be B-type and A-type stars, with no restriction on photometric uncertainties. The star symbol corresponds to the Cepheid S Vul.

$V) = 1.02 \pm 0.07$) and a distance modulus of $J–M_J = 13.2 \pm 0.2$ ($V_0–M_V = 12.47 \pm 0.29$), corresponding to a distance of $d = 3.12 \pm 0.42$ kpc. Similar values were used by Turner (2010) with an earlier version of the 2MASS calibration to establish very reasonable estimates for the reddening and luminosity of the 68^d Cepheid S Vulpeculae as a possible cluster member.

S Vul is represented by the star symbol in Figure 7. In the present instance the results imply intrinsic parameters of $(\langle B\rangle - \langle V\rangle)_0 = 0.87 \pm 0.07$ and $\langle M_V\rangle = -6.86 \pm 0.29$ for the Cepheid, close to what would be predicted empirically (see Turner 2010). The angular brackets denote intensity means. Spectroscopic observations are essential for confirming the picture implied by the 2MASS observations, since star counts for stars identified photometrically as B dwarfs display only a marginal concentration towards the cluster core. It appears that the main concentration of stars in Turner 1 corresponds to the old, sparse, foreground cluster identified in Figure 6, with contamination by a young group of background B-dwarfs located along the same line of sight.

3.3. *Collinder 419*

Collinder 419 is a sparse group of stars (Figure 8) of small angular diameter ($40\farcm5$ according to Collinder 1931) associated with the massive O9 V((n)) double star HD 193322 (Walborn 1972). Collinder estimated a distance of 1470 pc for the