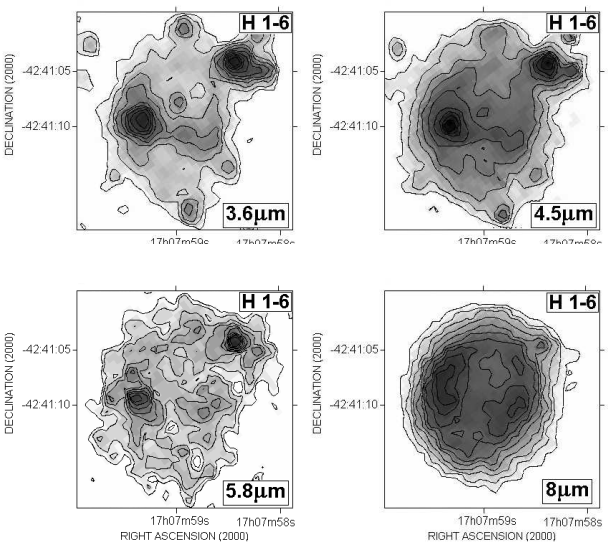

Fig. 12. Mapping of H 1-6 in the four IRAC bands, where the contour parameters [A, B, C] are given by [3.3, 1.64, 0.1126] at 3.6 μm, [2.4, 0.63, 0.1250] at 4.5 μm, [9.5, 6.40, 0.0427] at 5.8 μm, and [30, 25.62, 0.0227] at 8.0 μm.

for NGC 6720 (Bryce, Balick, & Meaburn 1994) and NGC 6781 (Ramos-Larios, Phillips, & Guerrero, in preparation).

The present contour results are shown in Figure 11, where it is clear that emission from the source is very faint indeed, and barely detected in the MIR. The apparent extension of the 8.0 μm shell to the left-hand side is a result of the contaminating effects of background emission. Excluding this factor, and taking into account the extreme noisiness of the results, it is clear that the MIR and optical results are likely to be reasonably consistent.

3.5. *H 1−6*

H 1-6 appears to be a reasonably bright PN at infrared wavelengths, although it has been very little studied in other wavelength regimes. The elliptical shell (Figures 1 and 12) has dimensions of 16.3×14.4 arcsec^2. Profiles through the source are illustrated in Figure 13, and show a double-humped structure arising from an internal ring. The 3.6–5.8 μm profiles are strongly dominated by a star at RP ∼–5 arcsec, however, and this causes some distortion of the IRAC band ratios (Figure 13, lower panel).

3.6. *H 1−7*

This nebula appears to have a rather irregular morphology at optical wavelengths (Schwarz et al. 1992), and has [SII] densities which are moderately

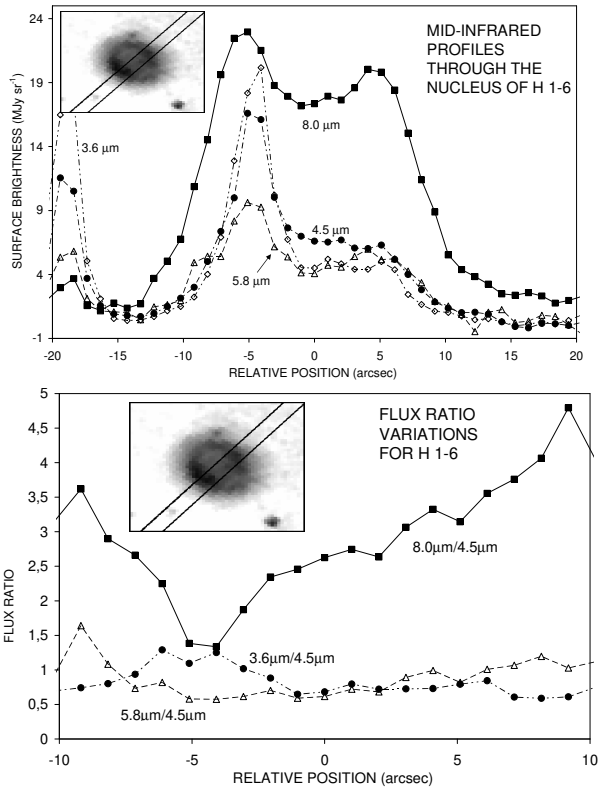

Fig. 13. As for Figure 3, but for the case of H 1-6. The peaks in the 3.6–5.8 μm channels close to RP ∼–5 arcsec are mostly attributable to an unrelated field star. This also leads to minima in the 8.0 μm/4.5 μm and 5.8 μm/4.5 μm ratios (lower panel), and a corresponding maximum in 3.6 μm/4.5 μm. There is, apart from this component, not too much evidence for variations in the IRAC ratios.

high ($\sim 4.2 \times 10^3$ cm^{-3}; Chappini et al. 2009). The N/O ratio of ≅ 0.56, and a value He/H ≅ 0.12 may imply that the source is a Type I PN (Chiappini et al. 2009). The optical diameter is quoted as 8.5 arcsec (Perek & Kohoutek 1967), which is significantly smaller than any of the contour maps in Figure 14, and less than half of the size observed at 8.0 μm (∼22 arcsec). This, and the tendency of the source to become larger towards longer IRAC wavelengths, may suggest that much of the longer wave emission is associated with the nebular PDR.

Further evidence for this is provided in Figure 15, where we show logarithmic profiles through the centre of the source (upper panel), and IRAC band ratios in the central portion of the envelope (lower panel). It is apparent from this that the shorter wave profiles (3.6 and 4.5 μm) cut-off close to RP ≅ −15 arcsec and +19 arcsec (an extension to RP ∼−25 arcsec is likely to be due to an unrelated