

THE EMISSION OBJECT SHARPLESS 207; IS IT A PLANETARY NEBULA?

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ABSTRACT. A discussion of Fabry P erot radial velocities of the H  line at 21 points over the face of S207 shows that it is an H-II region and not a PN as some authors believed. The morphology and the velocity data are consistent with its being a disk-line object seen face-on.

Key words: NEBULAE-H II REGIONS — INTERFEROMETRY — NEBULAE-PLANETARY

INTRODUCTION

The emission object S207 with a circular outline (diameter 4 arcmin) was first spotted by Sharpless (1959). Vorontsov-Velyaminov (1961) and Perek-Kohoutek (1967) list this object as a planetary nebula, whereas Marsalkova includes it as an HII region in her Catalogue (1974).

OBSERVATIONS

On two F.P. interferograms taken in the H  line with the 1-meter reflector at Tonantzintla Observatory we have measured radial velocities at 21 points over the face of S207. The average $V_{LSR} = -35.1 \text{ km s}^{-1} \pm 3.7$ (rms) which yields a kinematic distance for S207 ($l=151^\circ 2$, $b=2^\circ 1$) of 3.4 kpc using the Schmidt rotation law. Earlier determinations by Georgelin (1975) give an average $V_{LSR} = -35.4$, in excellent agreement with ours. The ionizing source is probably an O9.5 IV (or O9.5 V) star, centrally located within S207, with a photometric distance of 7.6 kpc. (Moffat et al. 1978). There is thus a very large discrepancy between the two distance estimates; such a circumstance is not too uncommon. Based on these distances the linear diameters are 3.9 and 8.8 pc respectively, a factor of about 5 - 12 times the maximum diameter of a classical planetary nebula; hence S207 is not a planetary nebula according to the accepted definition, but a small HII region.

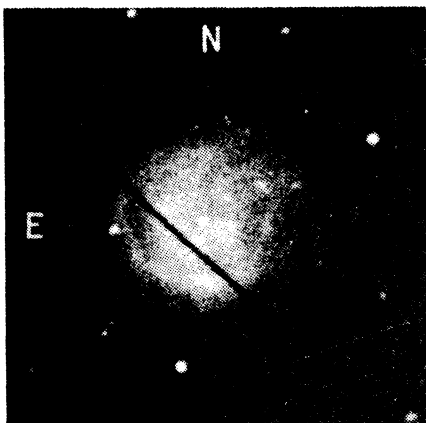


Fig. 1. Enlargement of an H  direct image of S207 taken with a focal reducer attached to the Cassegrain focus of the 1-meter reflector at Tonantzintla Observatory. The nebula has a diameter of about 4 arcmin.

DISCUSSION. S207 exhibits a curious morphology: fan-shaped spiral features join the central region to the outer circular outline (see Figure 1) suggestive of radial motions with respect to the central object. S207 has a striking resemblance to S153 as to the fan-shaped features. However, no expanding or contracting motions are detected within the uncertainty of our velocity data. The dispersion of the radial velocities in the central region is comparable (if not slightly smaller) than the outer regions; thus isotropic radial motions are not likely to exist. It may well be that S207 has the shape of a disk seen face-on and that the radial motions, if they are present, are within the disk and not detectable in the line of sight direction.

CONCLUSION. Our results both morphological and kinematical thus support the suggestion that matter is flowing out of (or flowing into) the central, rotating O9.5 star, the ionization source, matter which perhaps is funneled out (or in) through magnetic lines of force.

A detailed discussion of S207 will be published elsewhere.

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