

LARGE-SCALE EXPANSION IN THE CARINA NEBULA

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Abstract. Radio recombination line observations of the Carina nebula at 6 cm and 3.4 cm were made at Parkes. Around Carina II the profiles are separated by as much as 45 km s^{-1} . This is interpreted as expansion in the HII region.

Radio recombination line observations of the Carina nebula at 6 cm and 3.4 cm were obtained with the 64-m Parkes radiotelescope. The splitting into two overlapping profiles is seen all around Carina II, whereas Carina I shows single features. The greatest separation of the overlapping profiles is 45 km s^{-1} , a value comparable to radial motions in a number of HII regions as observed optically. There are strong arguments in favour of interpreting this phenomenon as an expansion in one HII region rather than as a chance coincidence of two HII regions along the line of sight. Radial velocities from H α observations over the nebula and the median velocities of the radio recombination lines agree well and lead to a kinematic distance of 2.7 kpc, which is in good agreement with recent distance determinations of stars in the Carina nebula and especially the two open clusters Trumpler 14 and 16. Two areas of largest linewidth and greatest separation of the two overlapping profiles are imbedded into a region of profiles with smaller separation that finally runs out into single features; the mean radial velocity of the observed lines are about the same all over the nebula. Centered to those expanding spheres are the two young open galactic clusters Trumpler 14 and 16 and the peculiar object η Carinae, suggesting that massive stellar winds are responsible for the observed expansion.

A fuller account will be published in *Astronomy and Astrophysics*.

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DISCUSSION

H. R. Dickel: M. Smith and T. Bohuski have optical data which show similar line splitting of $\sim 40 \text{ km s}^{-1}$ between the red and blue components (i.e., comparable to radio results). They also find large splitting well to the south of the two main radio continuum peaks but still well within the nebula. The $[\text{NII}]/\text{H}\alpha$ intensity ratio for the red component is different than that found for the blue component of the lines.

Huchtmeier: R. Louise, too, has observed line splitting in the H α over large parts of the Carina nebula.