AN EXTENDED NEBULOSITY SURROUNDING THE S DOR VARIABLE R 127

I. Appenzeller, B. Wolf
Landessternwarte, Königstuhl
D-6900 Heidelberg
Federal Republic of Germany

O. Stahl
European Southern Observatory
Karl-Schwarzschild-Str. 2
8046 Garching bei München
Federal Republic of Germany

ABSTRACT. Using the CASPEC echelle spectrograph of the European Southern Observatory, La Silla, Chile, we obtained new high resolution spectrograms of the LMC S Dor variable R 127 in the blue and red spectral range.

The red spectrogram, which contains the [N II] 6548 and 6583 and the [S II] 6717 and 6731 lines shows the presence of a well resolved extended gaseous nebula around R 127 (see Figures 1 and 2). The nebula (which is also detected at the Balmer lines) shows blueshifted and redshifted emission (projected) on the position of the stellar continuum, and no wavelength-shift at the maximum (East-West) distance from the star. Hence, the nebulosity appears to be an expanding shell, reminiscent of the nebula around the galactic extreme supergiant AG Car. The angular diameter (or East-West extension) of the nebula around R 127 is of the order 4", corresponding to $\approx$1 pc at the distance of the LMC. The expansion velocity of the R 127 nebula is found to be 28 km s^{-1} from our spectrograms. Hence, assuming a constant expansion velocity we derive a kinematic age of the R 127 nebula of $\approx 2 \cdot 10^4$ years. This corresponds closely to the expected lifetime of the S Dor evolutionary phase.

A more detailed description of our results will be published in the proceedings of the Workshop on "Instabilities in Luminous Early Type Stars" (C. de Loore, H. Lamers, eds.) Lunteren 1986.

I. Appenzeller and C. Jordan (eds.), Circumstellar Matter, 429–430.

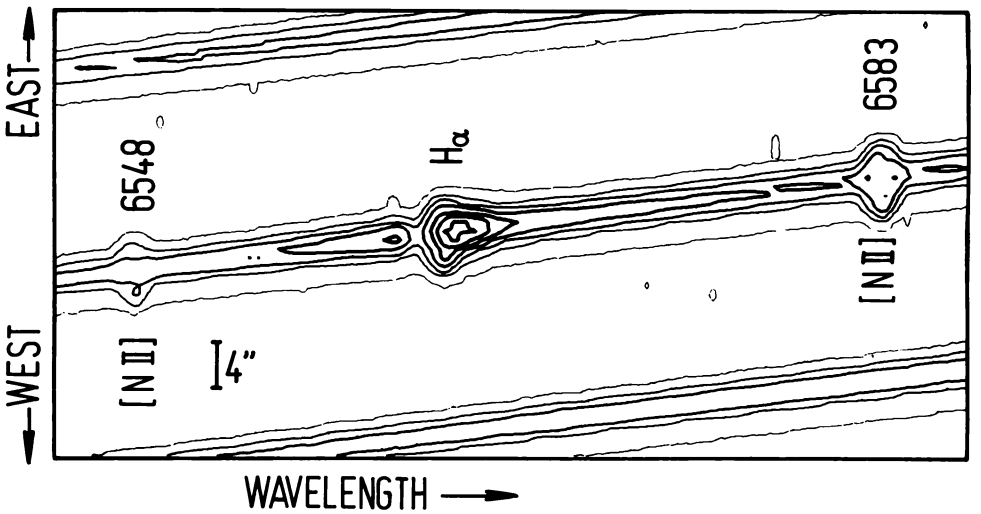

Figure 1. Contour plot of a section of the "red" echellogram of R 127, showing the angular extent of the [N II] and H_α lines. The intensity difference between two contours corresponds to a factor of two. The lowest contour corresponds to about 1 % of the maximum intensity.

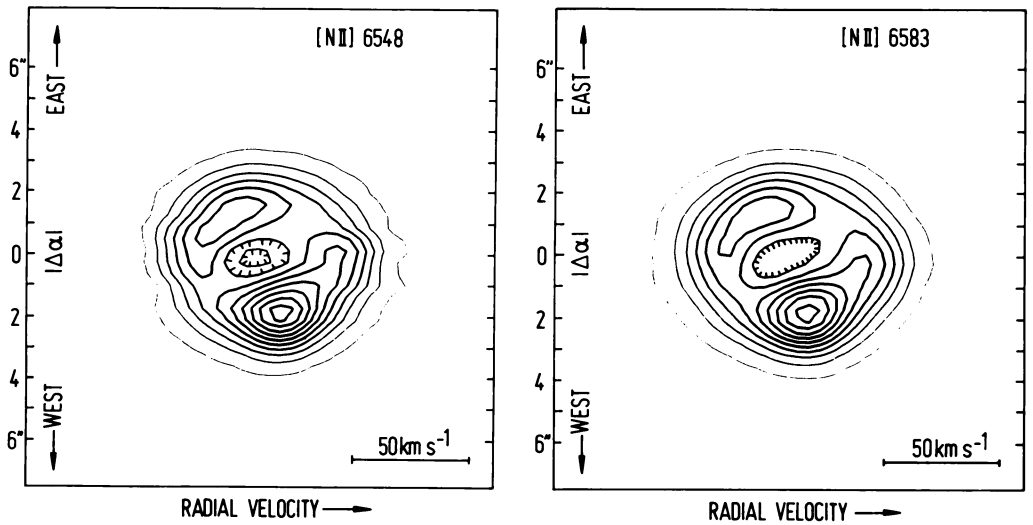

Figure 2. Contour plots of the velocity distribution of the [N II] emission along the projected spectrograph slit east and west of the star. The lowest intensity contour corresponds to 5 % of the maximum emission. Between the contours the intensity increases by 10 %. These plots have been derived from Figure 1 by subtracting the stellar continuum and rebinning to obtain equal ordinate values for points of identical angular distance from the star.

https://doi.org/10.1017/S0074180900156876 Published online by Cambridge University Press