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OBSERVATIONS OF MASSIVE SUPERSONIC OUTFLOWS IN HIGHLY LUMINOUS H II REGIONS

M. Relaño,[1] J. E. Beckman,[1,2] M. Rozas,[3] and A. Zurita[4]

Using Hα emission line profiles we detect outflowing ionized gas at velocities of order 50 km s^{-1} from representative luminous H II regions in two sample disk galaxies, NGC 3359 and NGC 1530, and calculate the physical parameters of the outflowing material.

The study is based on two types of observations: *continuum-subtracted Hα images*, whose calibration and analysis yields a complete catalog of Hα luminosities for the H II regions of a disk galaxy (Rozas et al. 2000), and *Fabry-Perot data cubes* of relative intensity, position and wavelength obtained in Hα for the same galaxies. The cube yields spectral emission profiles for each pixel in the galaxy image. We have selected a sample of spherical and isolated H II regions and integrated the profiles over the emission zone of the region, yielding an integrated profile which has been analyzed in terms of Gaussian components.

We found a central peak plus red and blue high-velocity, low-intensity Gaussian components. In Figure 1 we show the plot of the non-thermal component of the line width of the central emission peaks (derived by subtracting off in quadrature from the observed width the thermal, instrumental, and natural widths) against Hα luminosity of the region producing the line. The phenomenology of the red and blue observed components suggests a shell in expansion, with velocities of order $\sim 50\,\mathrm{km\,s^{-1}}$(see Figure 2). The physical parameters of the outflowing material show that the wings can be accounted for either in terms of the interaction of the combined winds of the OB stars (Dyson, Williams, & Redman 1995) with the surrounding gas or by acceleration of the gas via stellar radiation (Elitzur & Ivezic 2001). For further details see Relaño, Beckman, & Dyson (2003).

[1]Instituto de Astrofísica de Canarias, C/Vía Láctea s/n, 38200-Tenerife, Spain (mpastor@iac.es).
[2]Consejo Superior de Investigaciones Científicas, CSIC, Spain (jeb@iac.es).
[3]Observatorio Astronómico Nacional, UNAM, Ensenada, B. C., Mexico (maite@astrosen.unam.mx).
[4]Isaac Newton Group of Telescopes, UK (azurita@ing.iac.es).

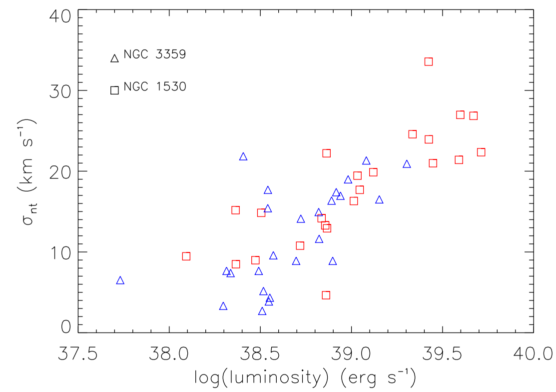

Fig. 1. The non-thermal component of the Hα emission line widths from the selected isolated H II in NGC 3359 and NGC 1530 vs. the Hα luminosity of the H II regions.

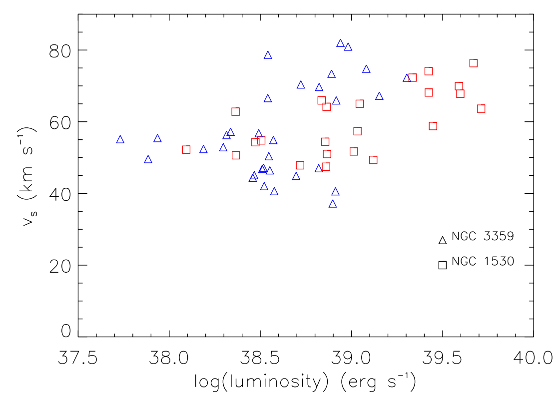

Fig. 2. Mean expansion velocity of the H II region shells vs. Hα luminosity for the same selected H II regions as in Figure 1.

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