

Internal kinematics and physical properties of HII regions in the Arp 270 system

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Abstract. We have observed Arp 270 using the GH α FaS Fabry-Perot spectrometer on the 4.2m William Herschel Telescope (La Palma). In the edge-on companion we detect a radial gas inflow of $\sim 0.36M_{\odot}/yr$ to the centre and also an axially confined outflow of $\sim 0.24M_{\odot}/yr$ from the nucleus in two opposing directions. We find two different behaviors between the physical properties of the HII regions. We suggest as a possible explanation a sub and supersonic regime.

Keywords. techniques: interferometric — galaxies: interactions — galaxies: kinematics and dynamics — ISM: HII regions

From maps with high velocity and angular resolution we detected inflow along the bar towards the NGC 3396 nucleus, and out of plane bipolar outflow. We detect two separate regimes for the relation between the H α luminosity and radius for the HII regions, (Fig. 1 right) implying a fall in mean electron density with radius for smaller radii, but a rise for larger radii (Fig. 1 left). The break luminosity, $L_{H\alpha} \sim 38.6$ dex, is the same as that for the break in galaxy luminosity functions (Bradley *et al.* 2006). The ranges in velocity dispersions suggest subsonic and supersonic regimes respectively.

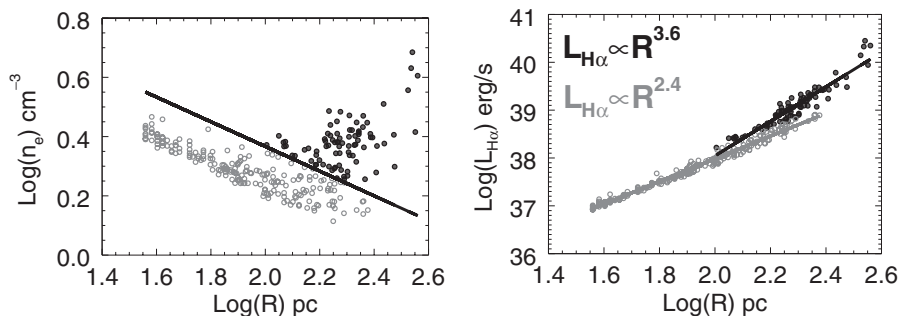


Figure 1. Left: electron density versus radius. The straight line represents the separation between regimes. Right: H α Luminosity versus radius. Open symbols represent the n_e decreasing with radius regime while the filled symbols represent the n_e increasing regime.

References

Zaragoza, J. *et al.* 2013, *in prep.*

Bradley, T. R. and Knappen, J. H., Beckman, J. E., & Folkes, S. L 2006, *AA*, 459, L13-L16