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A STUDY OF THE IONIZED GAS IN GIANT HII REGIONS IN NGC 6822

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We present the preliminary results of a study of physical properties of the gas in the giant HII regions regions Hubble V and Hubble X located in the galaxy NGC 6822. We have created maps in Hα emission constructed from longslit spectroscopic observations, which were performed at the William Herschel Telescope, Canary Islands, using the ISIS spectrograph.

NGC 6822 is an irregular galaxy of the local group located at a distance of 500 kpc and with a optical size of 2 kpc $\times$ 2.5 kpc. Optically, this galaxy has a large bar dominated by a irregular distribution of OB stars and HII regions. Hubble V and Hubble X are the two largest and brightest giant HII regions. Because to its proximity and size, the study of the kinematics and dynamics of Hubble V and Hubble X gives us the opportunity to obtain information regarding the physical conditions of the ionized gas from the emission spectrum, as well as the mechanism mechanical energy exchange between stars and ionized gas mass.

The spectra used in this study were obtained from data available at The Cambridge Astronomical Survey Unit (CASU) produced by the Isaac Newton Group of Telescopes located in the Canary Islands. The observations were carried out with the ISIS spectrograph of the William Herchel Observatory at the Roque de los Muchachos, using the technique of longslit spectroscopy. The spectra for Hubble V (X) were obtained in 4 (8) differente positions, all of them at position angle 90°, with a slit width of 1″ and a separation of 2″ between the centers of two consecutive slit positions. Two spectra were taken simultaneously for each position, one in the range between 6390 and 6849 Å (Red Arm) and one between 4665 and 5065 Å (blue arm), both with a dispersion approximately 0.4 Å/pixel. The slit lenght was 200″, with a spatial sampling along the slit of 0″.34/pixel in the red arm and 0″.36/pixel in the blue arm. Data reduction was performed using the IRAF data reduction software, following standard procedures.

Our main objective was to test a new technique to recreate the results of standard imaging from our longslit data. Once the emission derived for each spectrum was associated with a position in the space, we build a rectangular grid spaced regularly from a two-dimensional interpolation using the method of Renka & Cline (Cline & Renka 1984) (E01SAF routines and E01SBF the NAG Fortran Library Routine Document). The two-dimensional graphics were done with the program ORIGIN. The resulting emission map for Hubble V has an approximate size of $80'' \times 7''$, while for Hubble X is $52'' \times 15''$. Each individual point has been summed four pixels over space to overcome resolution of seeing. Figures 1 and 2 are reconstructions of the central regions of Hubble V and Hubble X.

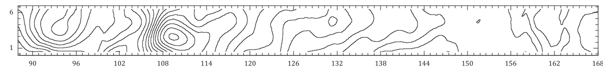

Fig. 1. Reconstruction of the emission map of Hα of the central region of Hubble V (see text). The spacing of the contours is logarithmic and the flow units are ADU.

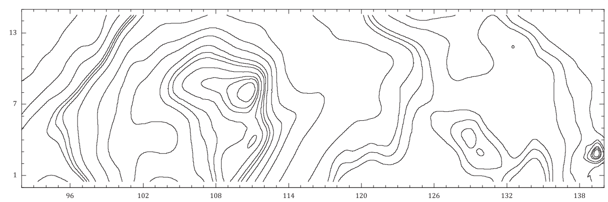

Fig. 2. Reconstruction of the emision map of Hα map of the central region of Hubble X (see text).

In Hubble V we see the central nucleous at the left side of the figure, with a 22% of the total emission of the region (O'Dell, Hodge, & Kennicutt 1999). Hx is resolved to actually be two quite distinct structures. The higher surface brightness component is a bright circle of about 14″ diameter and containing 68% of HX's Hα flux (O'Dell 1999) and a very bright core just south of this region. The maps created show an excellent agreement with the data available in the literature (Collier & Hodge 1994).

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