Identification and multi-filter photometry of HII regions from nearby galaxies with J-PLUS

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J-PLUS: Filters & Field of View

The Javalambre Photometric Local Universe Survey (J-PLUS) has already started the data acquisition phase at the Observatorio Astrofísico de Javalambre (OAJ) in Teruel, Spain. Benefiting from the large field of view (2 deg²) and the 12 filters set of the T80Cam at the T80/JAST telescope, we aim to study the properties of HII regions in nearby galaxies (z < 0.015). In this poster, we apply our procedures to the galaxy Messier 101.

Identification and characterization of HII regions

We have developed a fully automatized pipeline to identify and characterize the nearby universe HII regions. This pipeline: (1) Homogenizes the PSF in the 12 images of the different filters. (2) Estimates realistic photometric errors following Molino et al. (2014) method. (3) Constructs a detection image showing the excess of Hα+[NII], following Vilella-Rojo et al. (2015) prescriptions. (4) Performs the photometry in the 12 J-PLUS bands using as reference the Hα+[NII] detection image. (5) Constructs the photo-spectra for each identified HII region. We demonstrate the capabilities of this method by comparing synthetic aperture photometry from SDSS spectra with the Hα flux measured with J-PLUS data. Such comparison can be found in the poster by Vilella-Rojo et al.

Examples of the J-PLUS photo-spectra of 2 HII regions placed in M101, with their locations in the Hα+[NII] detection image showed in the middle panels. The green line is the best-fitting model for the continuum of the HII region data, the green points show the corrected flux according to it (see Vilella-Rojo et al. 2015, for details.)

References


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Science

Once the pipeline is implemented, we will generate a catalog of nearby HII regions at z < 0.015 in the 8500deg² of J-PLUS. With this catalog, we will study the impact of environment in the 2D star formation properties of nearby galaxies, taking advantage of the unprecedented large contiguous area that J-PLUS will offer.

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