

UNVEILING THE NATURE ULTRA-LUMINOUS X-RAY SOURCES THROUGH THE KINEMATICS AND STRUCTURE OF THEIR OPTICAL COUNTERPART

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We present observations scanning Fabry-Perot observations of the nearby galaxy NGC 5402 hosting one bright ultra-luminous X-ray source as part of a project to study the kinematics of the extended counterpart of this ULX and nature of the ionization of the gas.

With luminosities between 10^{39} and $10^{41} \text{ erg s}^{-1}$ in the 0.5–10 keV band, ultra-luminous X-ray sources (ULXs) lie between classic X-ray binaries and active galactic nuclei, and their nature is still far from clear (Colbert & Ptak 2002). In order to explore the different scenarios for the ULX phenomenon, we have started a series of observations of the optical counterparts of ULXs taken from the works by Swartz et al. (2004, 2011) on the ULX source population from the Chandra archive of galaxies using different observational techniques both on “small” and on large telescopes. Using the scanning Fabry-Perot interferometer PUMA on the 2.1m telescope of the OAN we are studying the global kinematics of the ionized gas of nearby spiral galaxies hosting ULXs in order to trace the global motion of the gas and to see if there are any particular motions (non-circular motions) close the position of the ULX that could be associated to star-forming events, inflows of outflows.

Figure 1 shows one the galaxies studied. NGC 5204 is a SA(s)m HII galaxy which has been previously studied by (Roberts et al. 2001; Liu, Bregman & Seitzer 2004). The observed (x, y, λ) cube shows

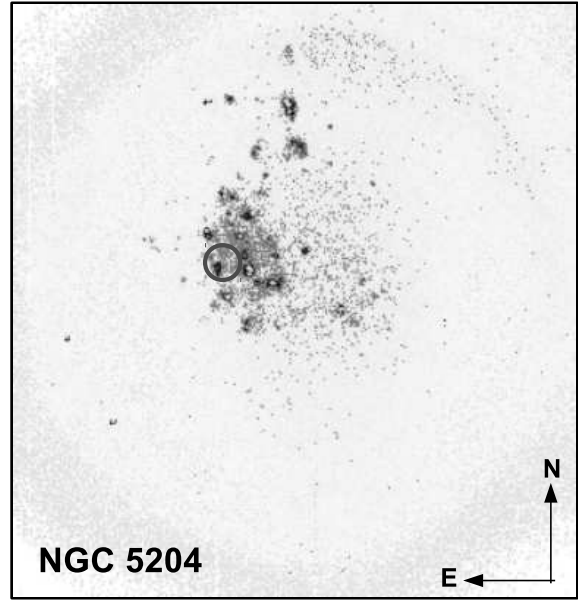


Fig. 1. Monochromatic $H\alpha$ image of NGC 5204 taken with the scanning Fabry-Perot interferometer PUMA (Rosado et al. 1995). Small circle indicates the position of one of the ULXs in the galaxy.

$H\alpha$ emission associated to one of the ULXs. On-going analysis will show if there are any particular motions next to this source.

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