

Disentangling the stellar populations of the counter-rotating stellar disc in NGC 5719

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Abstract. We present the stellar populations properties of the interacting spiral NGC 5719, which is known to host two cospatial counter-rotating stellar discs .

1. Introduction, analysis and results

The presence of stars counter-rotating with respect to other stars and/or gas has been detected in several disc galaxies and is commonly interpreted as the end result of a retrograde acquisition of external gas and subsequent star formation (Corsini 2014). This picture can be directly tested in the NGC 5719/13 galaxy pair. NGC 5719 is an almost edge-on Sab galaxy with a prominent skewed dust lane at a distance of 23.2 Mpc.

The integral-field spectroscopic observations were carried out in service mode with the Very Large Telescope at the European Southern Observatory in Paranal. The HR blue grism covering the spectral range 4150-6200 Å and the 0.67 arcsec per fibre resolution were used. The instrumental spectral resolution was equivalent to 115 km s⁻¹ (FWHM).

At each position in the field of view, the observed galaxy spectrum was decomposed into the contributions of the spectra of two stellar and one ionized-gas components. Therefore we measured separately the kinematics and line strengths of the Lick indices of the two stellar counter-rotating components. We also derived the kinematic of the gaseous component. Finally, we modeled the data of each stellar component with single stellar population models that account for the $[\alpha/\text{Fe}]$ overabundance.

We find that the stellar counter-rotating component is younger, less rich in metals, more α -enhanced, and less luminous with respect the main stellar body of the galaxy and it is kinematically associated with the ionized-gas disc (Coccato *et al.* 2011). These findings prove the scenario where gas was accreted first by NGC 5719 on to a retrograde orbit from the large reservoir available in its neighbourhoods as a result of the interaction with its companion NGC 5713, and subsequently fuelled the in situ formation of the counter-rotating stellar disc.

References

- Coccato, L., Morelli, L., Corsini, E. M., *et al.* 2011, *MNRAS*, 412, L113
Corsini, E. M. 2014, *Astronomical Society of the Pacific Conference Series*, 486, 51