

The kinematics of the Wolf-Rayet galaxy pairs NGC 1741 and NGC 7714/7715

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Abstract. We present preliminary results of the kinematics of the Wolf-Rayet galaxy pairs: NGC 1741 and NGC 7714/7715.

1. Introduction

Galaxy pairs and groups of galaxies are important in the comprehension of the starburst phenomena, because it is thought that galaxy interactions could produce an enhancement of starburst activity within the galaxies. Here we present a kinematic study of the interacting pair NGC 1741 and the Hickson Compact Group No. 31 (NGC 7714/7715).

2. Observations

The observations of these galaxies were carried out at the f/7.5 Cassegrain focus of the 2.1m telescope of the Observatorio Astronómico Nacional at San Pedro Mártir, B.C., México using the UNAM Scanning Fabry-Perot (FP) Interferometer PUMA (Rosado *et al.* 1995). The cubes have a spatial resolution of $1''.18/\text{pixel}$ and a field of view of $10'$. The scanning FP interferometer is characterized (at H α) by: free spectral range of 19.94 \AA (equivalent to 909 km s^{-1}) and sampling spectral resolution of 0.42 \AA (equivalent to 18.9 km s^{-1}).

3. NGC 7714/7715 (KAR 587, VV 51, Arp 284)

This is an interacting galaxy pair whose components are the spiral galaxies NGC 7714 and NGC 7715. NGC 7714 is a SBb peculiar starburst galaxy with a bright nucleus where a WR feature has been detected (González-Delgado *et al.* 1995). NGC 7715 is seen almost edge-on. A bridge of stars connects the galaxies and it is detected in the continuum images.

In our observations, we are able to detect a bridge of ionized hydrogen formed by a chain of H II regions that connects the two galaxies. This bridge is coincident with the H I bridge detected by Smith *et al.* 1997 and its location is shifted relative to the bridge of stars. The radial-velocity profiles obtained from our observations indicate, that the gaseous bridge has a similar systemic velocity as the nucleus of NGC 7714. On the other hand, the nucleus of NGC 7714 has a large velocity dispersion of 181 km s^{-1} .

Table 1. Morphological and kinematic properties of H 31

component	morphological type	peak v_{helio} (km s^{-1})	velocity dispersion (km s^{-1})
H31 A	Sdm	+4068	124
H31 B	Sm	+4129	143
H31 Ba	Sm	+4089	61
H31 Bb	Sm	+4139	76
H31 Bc	Sm	+4179	76
H31 C	Im	+4008	141
H31 E	.	+3980	101
H31 F	.	+3969	80
H31 G	.	+4011	76

4. NGC 1741 – Hickson Compact Group H 31 (VV 524, Arp 259)

This system is an association of at least six galaxies (A–D, G, Q). Two of its members (A and C) show broad WR features in their spectra indicating a recent burst of massive star formation, probably due to the interaction or merging. It is thought that this compact group is in the process of merging to a single elliptical galaxy. In our observations we detect six of the eight components reported by Rubin *et al.* 1990. By far, Component C (Mrk 1089) is by far the brightest. We have obtained radial-velocity profiles integrated over boxes containing each component. Table 1 lists the morphological types, heliocentric peak velocities and velocity dispersions of the several components detected in our observations. The heliocentric radial velocities agree quite well with those reported by Rubin *et al.* (1990), when one takes into account that some of the profiles are not simple and, consequently, it is difficult to measure accurately the peak velocity. We also find that components F and G have lower velocity dispersions, more characteristic of GEHRs. In addition, the three knots detected in component B have GEHRs-type velocity dispersions too. Thus, we can conclude that the components showing the WR features have the largest velocity dispersions. One could speculate that large velocity dispersions are related to the origins of broad WR features.

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References

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