Dorado and its member galaxies H alpha imaging of the group backbone

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Abstract

Context. Dorado is a nearby, rich and clumpy galaxy group that extends for several degrees in the southern hemisphere. Although several studies have been dedicated to defining its members, their kinematics, and the hot and cold gas content, in particular HI, their present star formation activity remains unknown.Aims. For the first time, we map the H alpha distribution as a possible indicator of the star formation activity of Dorado members, a large fraction of which show interaction and merging signatures independently of their morphological type.Methods. With the 2.5 m du Pont and the 1m Swope telescopes, we obtained narrow-band calibrated images of 14 galaxies that form the backbone of the group, mapping H alpha+[N II] down to a few 10(-17) erg cm(-2) s(-1) arcsec(-2). We estimated the galaxy star formation rate from the H alpha fluxes and corrected for Galaxy foreground extinction and [N II] contamination.Results. We detected H alpha+[N II] emission in all galaxies. HII regions clearly emerge in late-type galaxies, while in early-type galaxies the H alpha+[N II] emission is dominated by [N II], especially in the central regions. However, HII complexes are revealed in four early-type galaxies. Even in the compact group SGC 0414-5559, in the projected centre of Dorado, HII regions are found both throughout the late-type galaxies and in the very outskirts of early-type members. Considering the Dorado group as a whole, we notice that the H alpha+[N II] equivalent width, a measure of the specific star formation, increases with morphological type from early- to late-type members, although it remains lower than that observed in similar surveys of spiral galaxies. The star formation rate of the spiral members is in the range of what is observed in similar galaxies surveys (James et al., 2004). However, in three spiral galaxies, NGC 1536, PGC 75125, and IC 2058, the star formation rate is well below the median for their morphological classes. Conversely, the star formation rate of some early-type members tends to be higher than the average derived from H alpha+[N II] surveys of this morphological family.Conclusions. We detected H alpha+[N II] in all the early-type galaxies observed and half of them show HII regions in well-shaped rings as well as in their outskirts. These findings suggest that early-type galaxies in this group are not dead galaxies: their star formation has not yet shut down. Mechanisms

such as gas stripping and gas accretion through galaxy-galaxy interaction seem relevant in modifying star formation in this evolutionary phase of Dorado.

Palabras clave

Palabras clave de autor:galaxies: elliptical and lenticular; cD; galaxies: spiral; galaxies: ISM; galaxies: interactions; galaxies: evolution
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