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The Kinematics of Extended Hα Emission in Blue Compact Galaxies

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Abstract. Blue Compact Galaxies (BCGs) have received interest mainly because they comprise the best available test-beds for studies of low-metallicity star formation (SF) and allow the study of relatively unevolved systems at low redshift. Their ongoing phase of intense star formation is a transient phenomenon and the best candidates for its trigger are interactions and mergers. Studies of the kinematics are important for the understanding of this process.

We present spatially resolved kinematics from the H_α line in five BCGs that show an extended region of ionised emission around the central starburst. We find this region to have near-spherical isophotes at large radii and to be dynamically decoupled from a central disturbance. A scenario where the strong triggered star formation in the center ionises the surrounding gas cloud, still following its original motions, can qualitatively explain these common features. The poster, including the figures, can be found at `http://thomasmarquart.net/pspdf/prague-marquart.pdf`.

Keywords. galaxies: dwarf, galaxies: kinematics and dynamics, galaxies: starburst

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In extension of a previous study (Östlin *et al.* 2001), we have observed 50 BCGs and emission-line galaxies with the scanning Fabry-Perot instrument CIGALE at the ESO 3.6m telescope. Targeting the Hα line, we have measured spatially resolved kinematics with an accuray of better than $10 km\, s^{-1}$. We present here five cases (SBS0335-052, IIZw40, Mrk930, UM456 and He2-10) that show a large spherical region of ionised gas.

The almost spherical outer isophotes of the Hα emission, in contrast with the irregular morphologies of the stellar component, suggest the starburst as a central ionising source. In extreme cases, a starburst in a dwarf galaxy is indeed expected to be able to ionise the surrounding gas reservoir, resulting in extended emission from the warm ISM (e.g. Veilleux *et al.* 2003).

The presented BCGs not only share the extended Hα emission, but also several kinematical features: A gradient in velocity over the whole detection area, suggesting rotation, with velocities still at the outer edges. This is an indication that we only see the ionised part of a larger cloud of neutral hydrogen. The central starburst region deviates kinematically from this large-scale rotation and shows decoupled rotation that becomes especially prominent after subtracting a model for the large-scale rotation – an indication of the starburst being kinematically triggered by a merging event or of bipolar outflows.

References

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