

Fuelling Low-powered Radio Galaxies

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Introduction and motivation

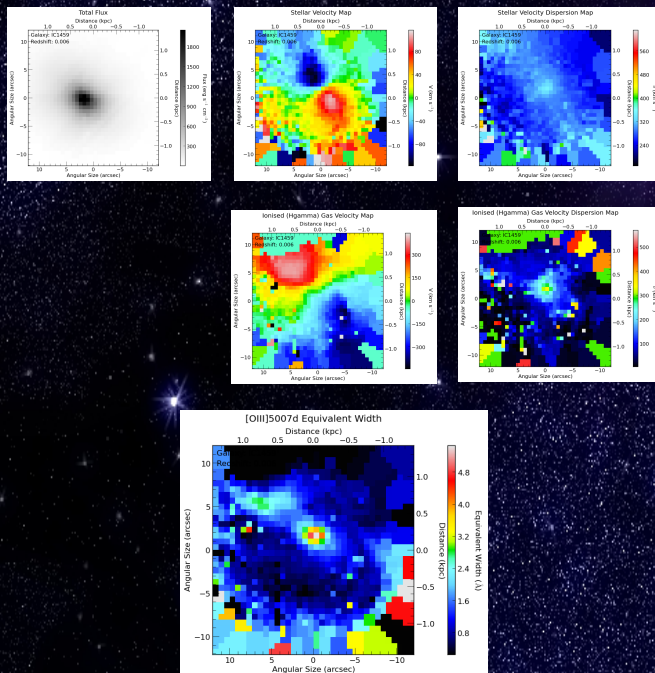
The current consensus is that Powerful Radio Galaxies are triggered by mergers with gas rich galaxies, but the fuelling of Low Powered Radio Galaxies (LPRGs) still remains an open question. Arguments have been made that LPRGs may accrete enough material directly from hot intergalactic medium while others emphasise the importance of the cold gas from wet mergers. In addition, internal mechanisms such as stellar mass loss and cooling of the hot gas phase are also not yet ruled out as a source of fuel for the AGN.

We present VLT/VIMOS observations of a complete volume limited ($z < 0.03$) sample of radio-loud, Early-Type Galaxies. All objects are relatively low powered in radio emission and have 12CO(2-1) detections with APEX. We find a misalignment in the kinematics of the ionised gas and stellar components, suggesting an external origin for the gas that is driving the AGN and associated feedback. Moreover, observations of kinematically decoupled stellar substructures point to a merger origin to this reservoir.

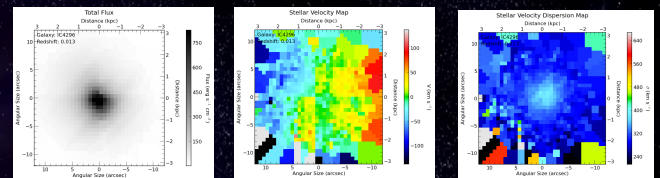
Observations

An early look at the kinematics of sub-sample of low-powered radio galaxies:

IC1459

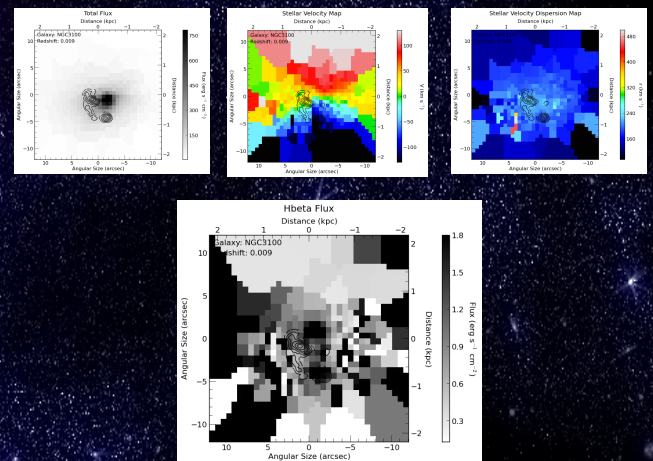


IC4296



NGC3100

VIMOS with ALMA overlay



Conclusion

Here we show some of the measurements we can make with VIMOS, while demonstrating some of its limitations. For local images in IFU mode we can measure OIII, H β and H γ lines as well as stellar dynamics. The stellar velocity map for IC 4296 shows some of the limits of VIMOS, namely issues regarding the quadrants of the detector.

While in some cases we are constrained by the S/N ratio, we can clearly see range of structures, such as the kinematically decoupled core (KDC) in IC1459. We have ALMA images (CO) for NGC 3100 which are shown by the contours. There seems to be an interesting misalignment between the H β and CO.

Further Work

Going forwards, we await further ALMA results to supplement the VIMOS sample. The group is also considering additional radio images.

If the VIMOS data proves to be of sufficient quality then we will also look to undertake a stellar population study of these galaxies.

References

Data reduced with P3D (beta mode) developed by B. Hasemann
Data analysed with pPXF: Cappellari, Emsellem 2004, PASP, 116, 138