

Detailed stellar and gaseous kinematics of M31

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Abstract. We have collected optical integral field spectroscopic data for M31 with the spectrograph VIRUS-W that result in kinematic maps of unprecedented detail. These reveal the presence of two kinematically distinct gas components.

1. Introduction

Due to its proximity M31 is an ideal target to investigate the kinematics and dynamics of a spiral galaxy in high detail. However, its large angular extent complicates the collection of spectroscopic data for the whole galaxy. With the arrival of the integral field spectrograph VIRUS-W (Fabricius *et al.*, 2008), it has become possible to obtain high-quality two-dimensionally distributed spectra over a large field of view.

2. Conclusions

Our data cover the bulge completely and sample the disk along six different position angles, reaching approximately one scalelength along the major axis (Courteau *et al.*, 2011). We fit the line-of-sight velocity distribution of the stars with pPXF (Cappellari, Emsellem, 2004) and the one of the H β , [OIII] and [NI] emission lines with GANDALF (Sarzi *et al.*, 2006). While the stellar velocity field is fairly regular, the gas emission lines in a large fraction of our covered region show double peaks, pointing at two kinematically distinct gas components. The velocity of the first component reaches 300 km/s, the second component is significantly slower with a maximum of about 140 km/s. We are currently testing whether the kinematics of the two components can be explained by either a warp or the presence of a secondary disk at higher inclination.

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References

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