

The central mass distribution of spiral galaxies from their inner rotation curves

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We have recently completed an observing programme which has obtained H α Fabry-Perot kinematic data for 29 spiral galaxies (21 of those are barred). These galaxies also have deep *Spitzer* Survey of Stellar Structure in Galaxies (S⁴G; Sheth et al. 2010) photometry which allow detailed estimates of the stellar mass distribution. The seeing-limited spatial resolution and 8 km/s velocity resolution of the H α kinematic data allows us to study the detailed rotation profiles of the galaxies' inner regions (which typically suffer from beam smearing effects in HI studies).

Here we will present results exploring correlations between the *slope* of the inner rotation curves and galaxy properties such as SFH, stellar mass concentration, bar strength and nuclear activity. Knapen et al. (1999) studied the inner parts of the rotation curves of 5 star forming galaxies, showing that two of them presented different rise than the other three, concluding that slowly rising rotation curves indicate the presence of a single ILR, whereas quickly-rising ones would present a pair of ILRs (see Shlosman 1999).

Recent simulations (e.g., Governato et al. 2010) have predicted that the central regions of dark matter profiles in galaxies may be transformed from cusps to cores due to baryonic processes (feedback from SNe and AGN) and we will discuss how our high precision kinematic data offer unique observational tests of such simulations.

References

- Governato F. et al., 2010, *Nature*, 463, 203
- Knapen J. H., Laine S., Relaño M., 1999, *APSS*, 269, 605
- Sheth K. et al., 2010, *PASP*, 122, 1397
- Shlosman, I.: 1999, in *The Evolution of Galaxies on Cosmological Timescales*, J.E. Beckman & T.J. Mahoney (eds), *ASP Conf. Series* 187, 100.