# The MEDIDO project: surprising result for Leo I


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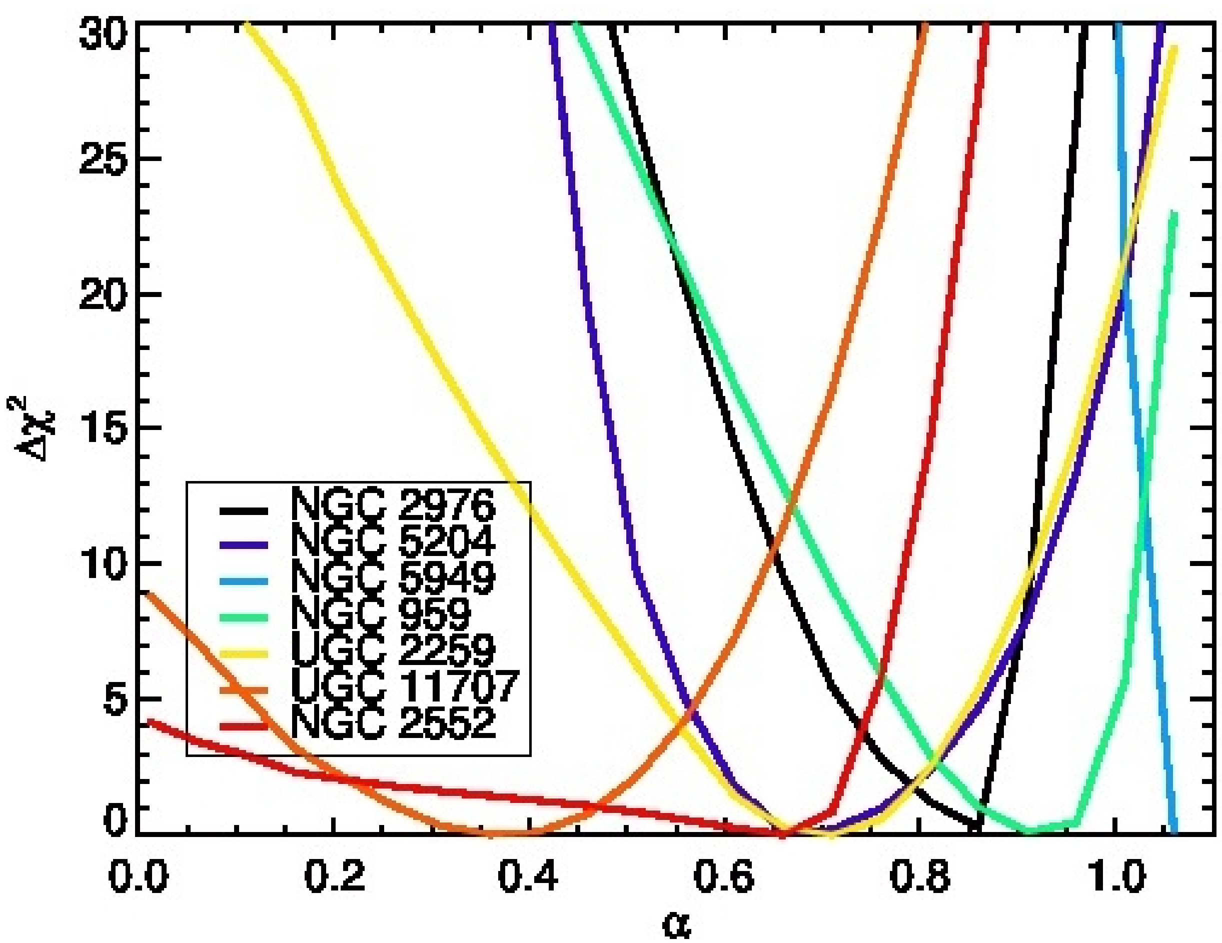
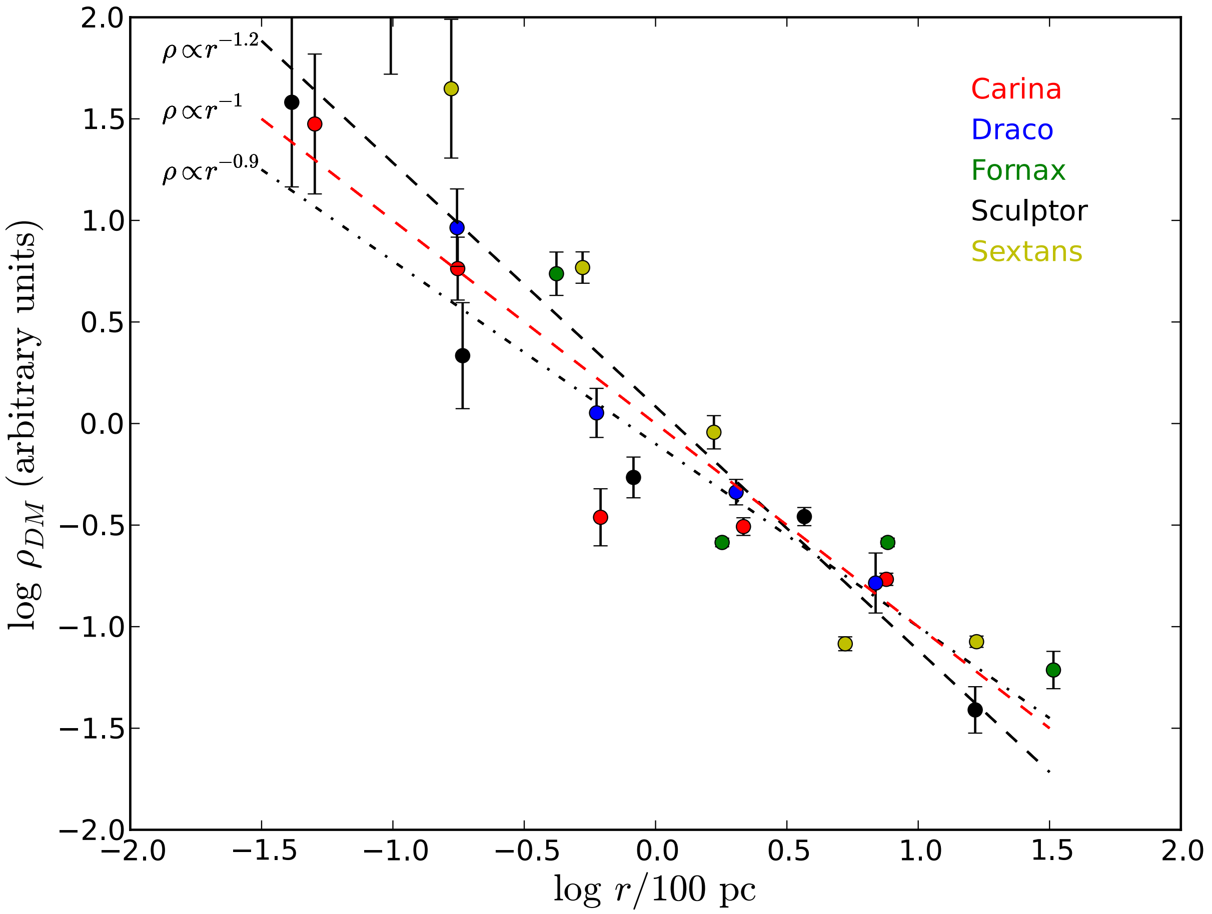
# Shape of dark matter haloes in dwarf galaxies



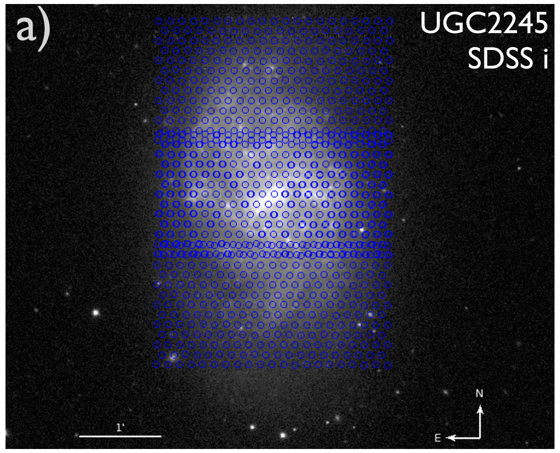

Adams et al, 2013

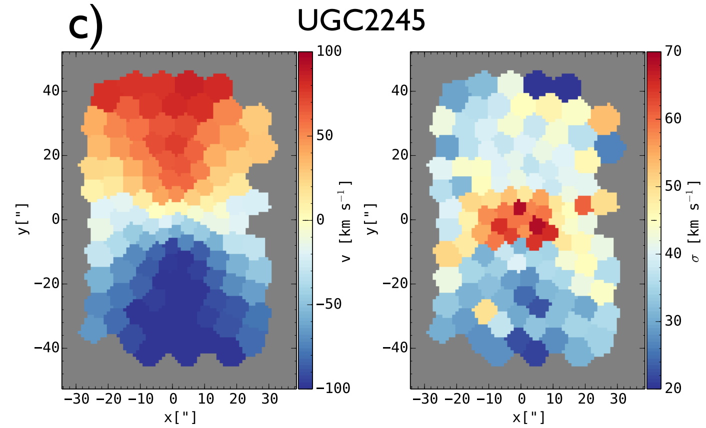



Jardel & Gebhardt, 2013

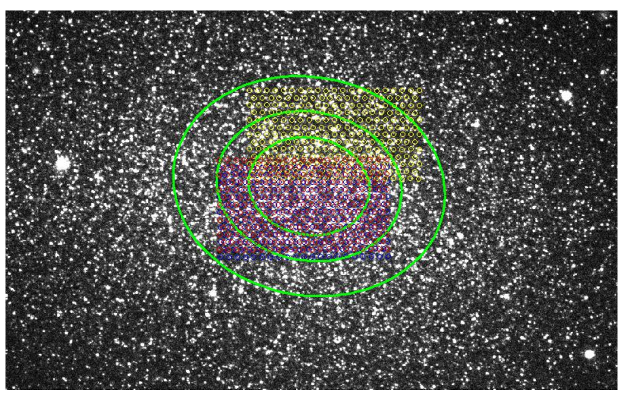
- Core/cusp problem: measure the central shape of DM halos
- Missing Satellite problem: measure accurate velocities for dwarf galaxies and test DM content for globular clusters

# MEDIDO (MEasuring Dynamics In Dwarf Objects) Sample

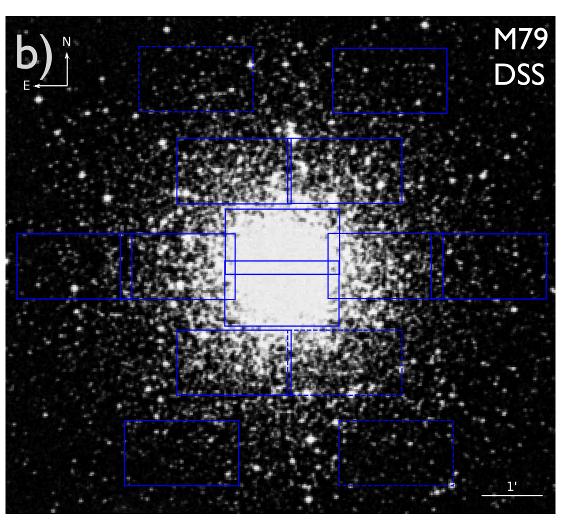


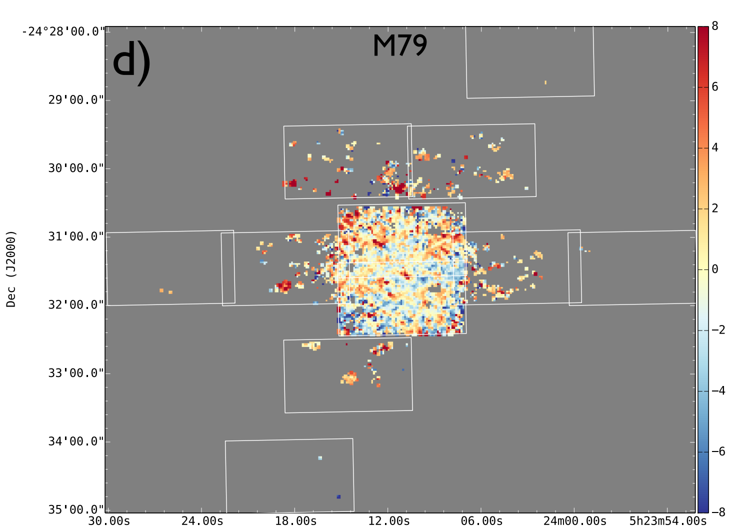




Unresolved dwarf galaxies



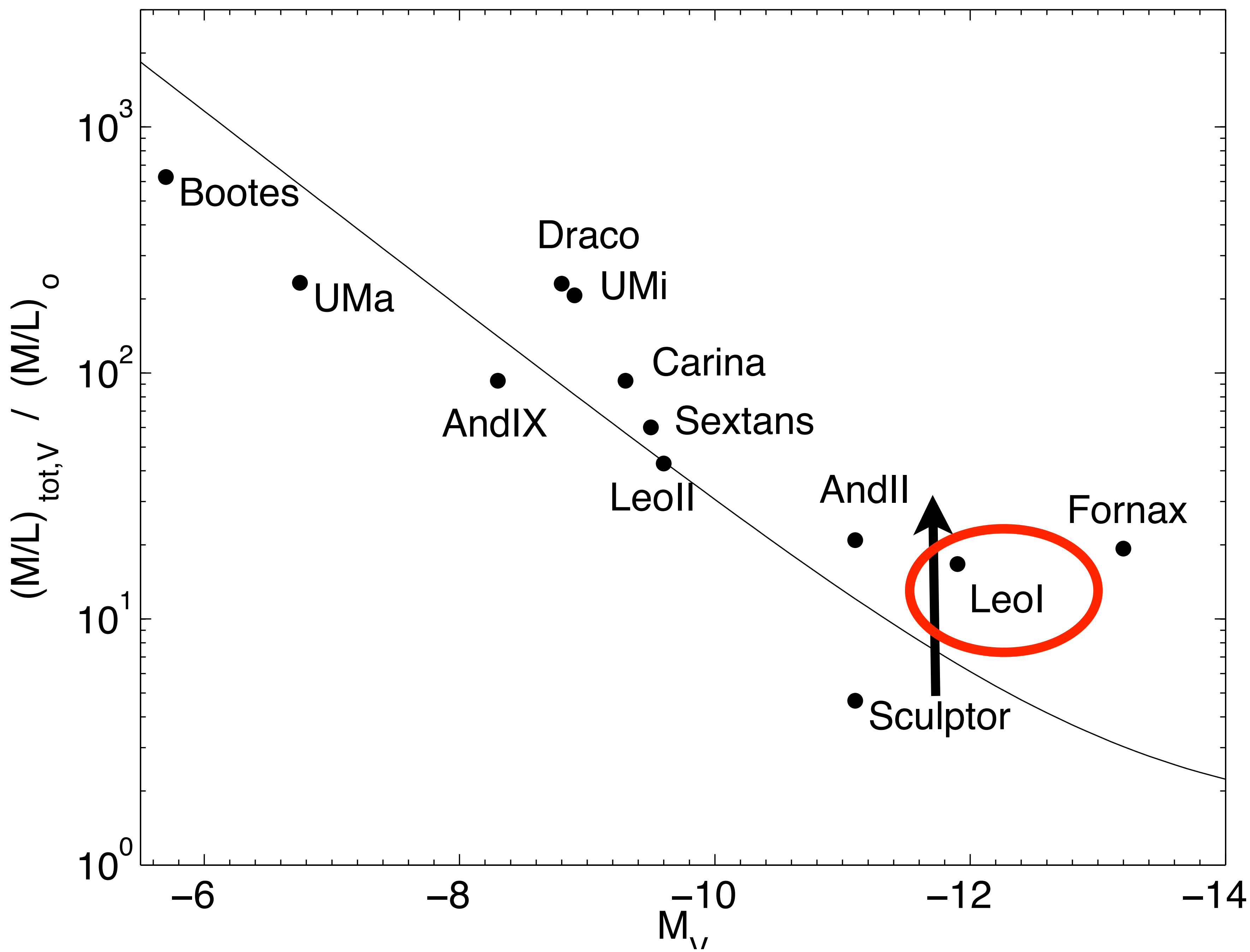
Resolved dwarf galaxies




Galactic globular clusters

# Leo I among MW dwarf spheroidals



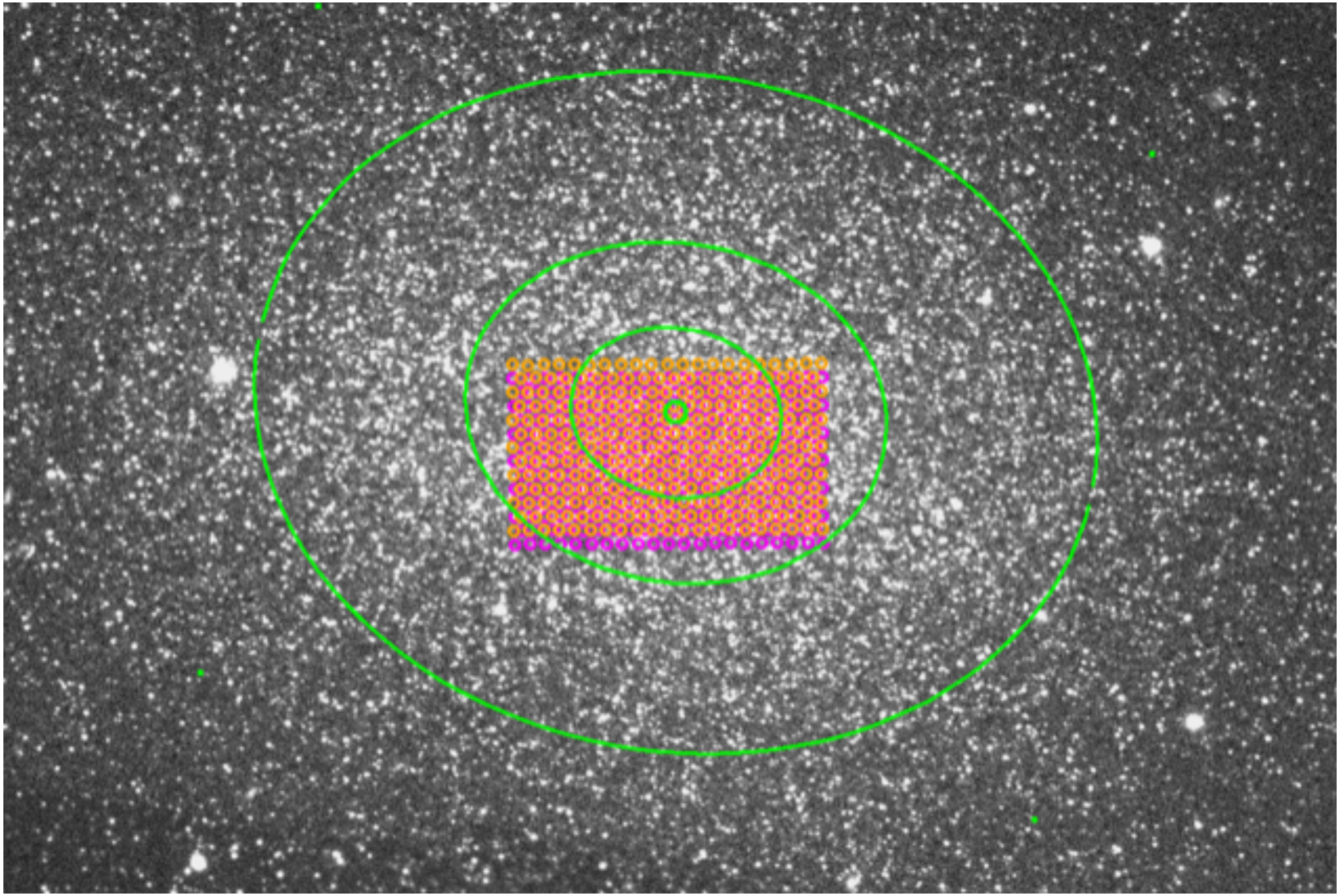

Mateo et al. 1998

Wilkinson et al 2006

Gilmore et al. 2007

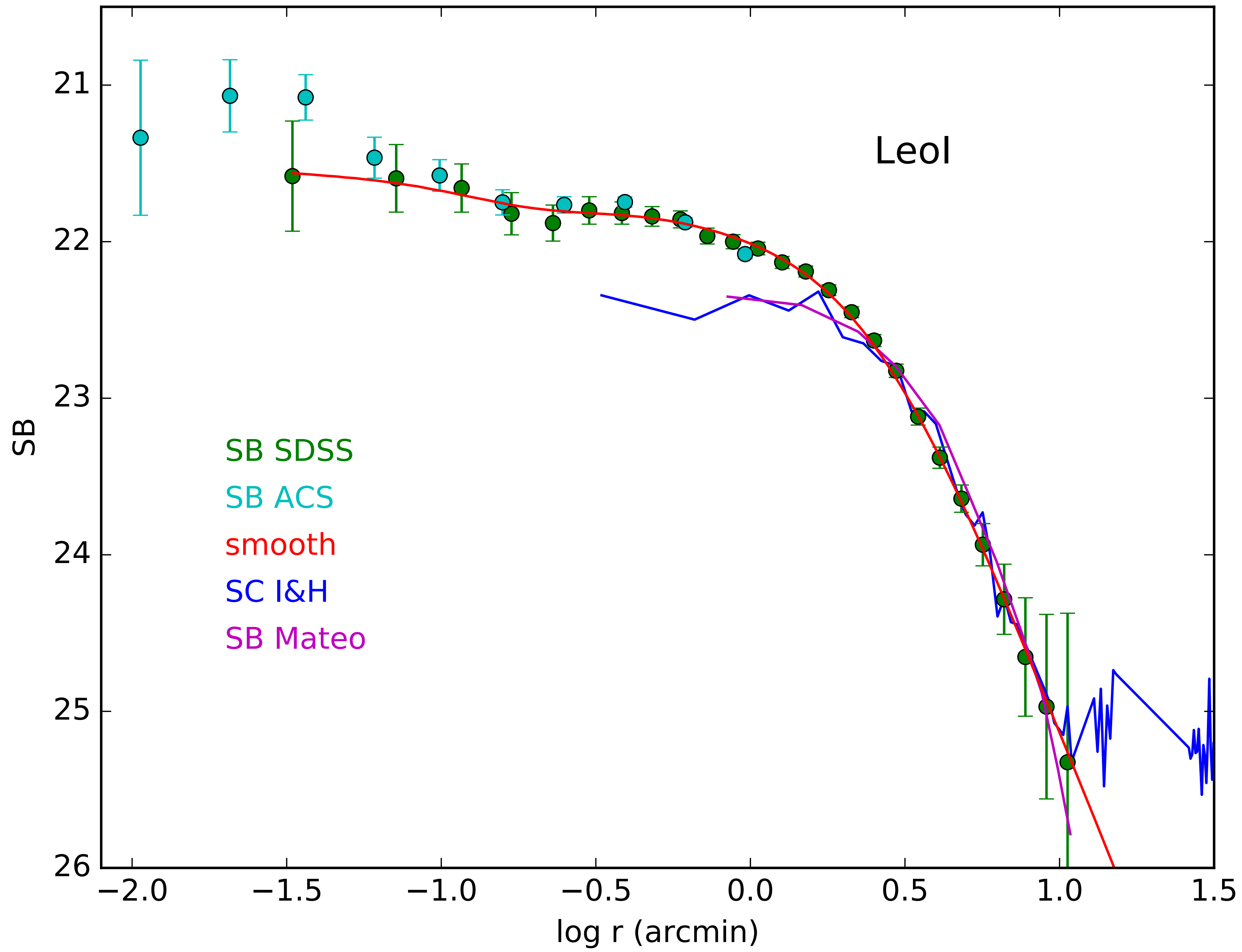
- Leo I is almost the richest MW dwarf galaxy, and it has a low measured M/L

# VIRUS-W coverage



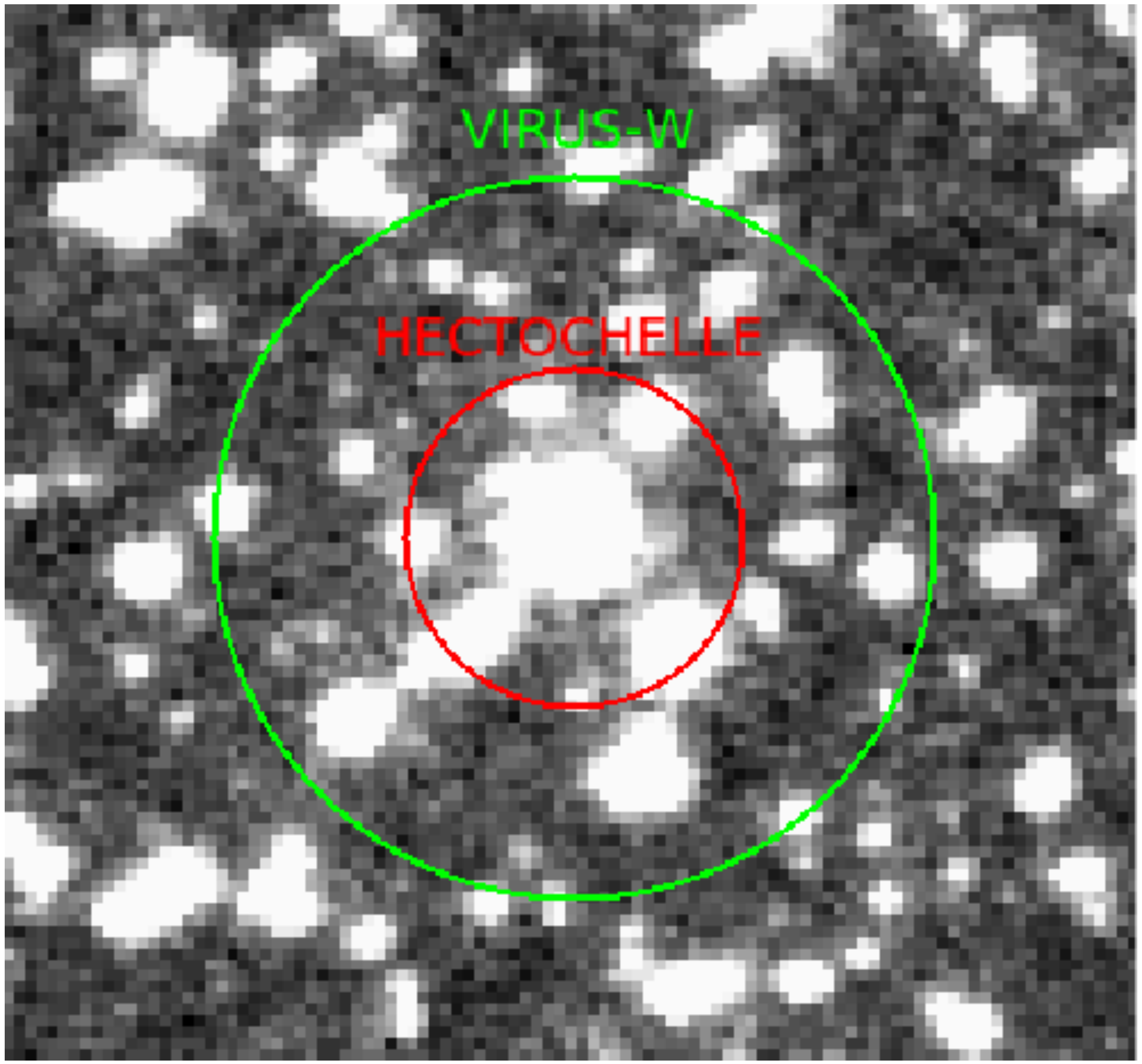
- Previously only a couple dozen stars measured in the central region by Mateo et al. (1998)

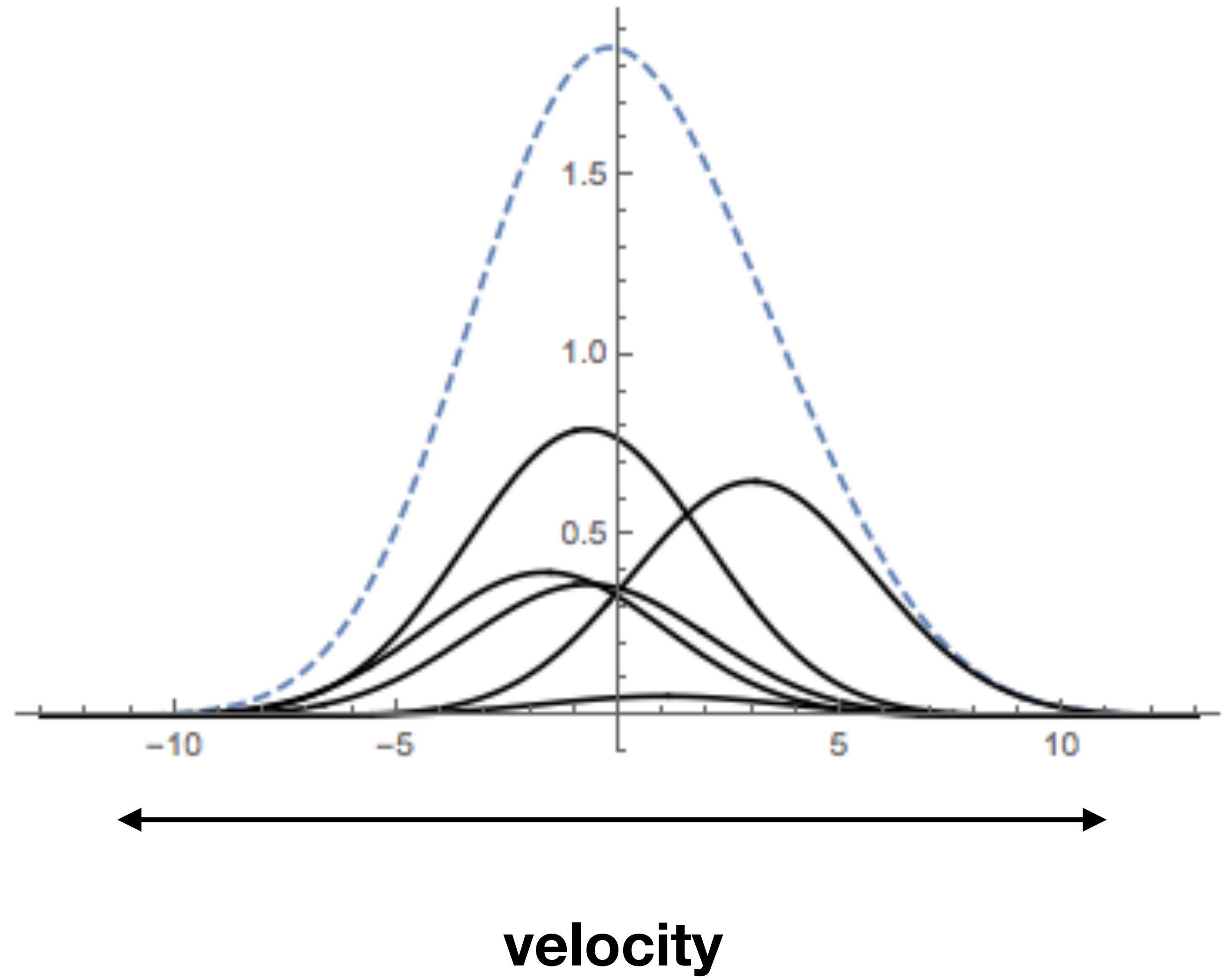
# Updated density profile




- Central surface brightness profile shows a shallow cusp, both for ground based and HST data

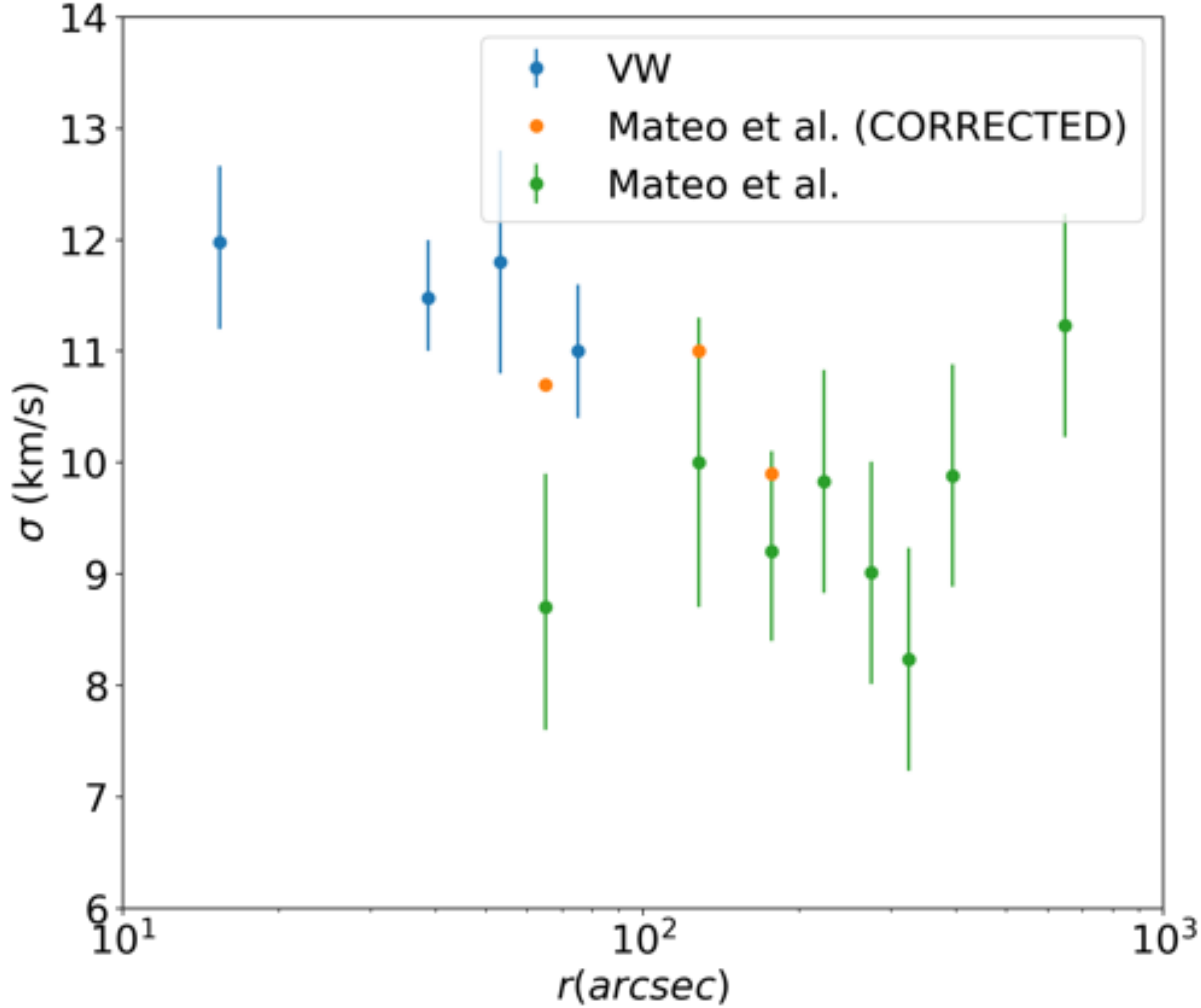
# Kinematics with virus-w IFU



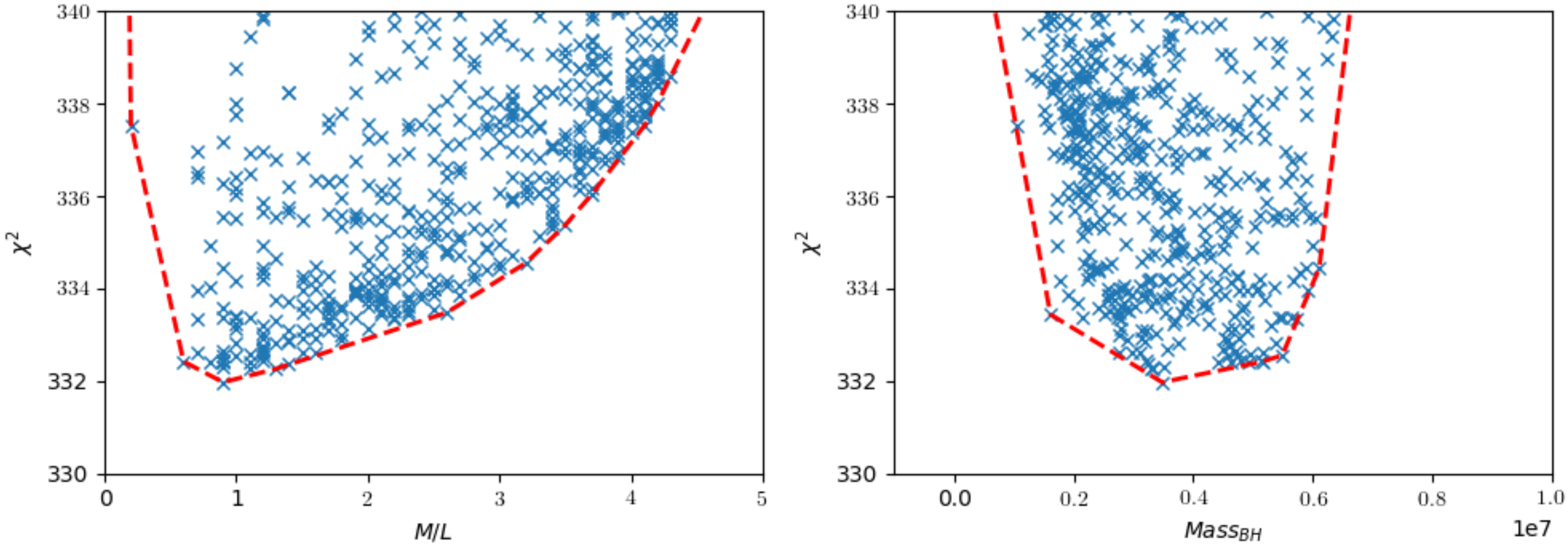

- Crowding is an issue in central regions
- We can’t use individual velocity measurements

# Updated velocity dispersion profile




- Central Mateo points suffer from crowding effects
- VIRUS-W measures a slight velocity rise towards the center

# Results from Schwarzschild modeling




- Best fit black hole mass is > $10^6$ $M_{sun}$
- Best fit M/L is lower than for previous models. The shape of the dark matter halo is unconstrained.

# Conclusions

- Leo I shows a central density cusp. Steeper than predictions from DM cosmological simulations
- The central velocity dispersion shows a clear rise towards the center
- Results from Schwarzschild modeling point to a large central BH and less dark matter than previously measured