Stellar kinematics out to large radii in early-type galaxies

Anne-Marie Weijmans
Leiden Observatory

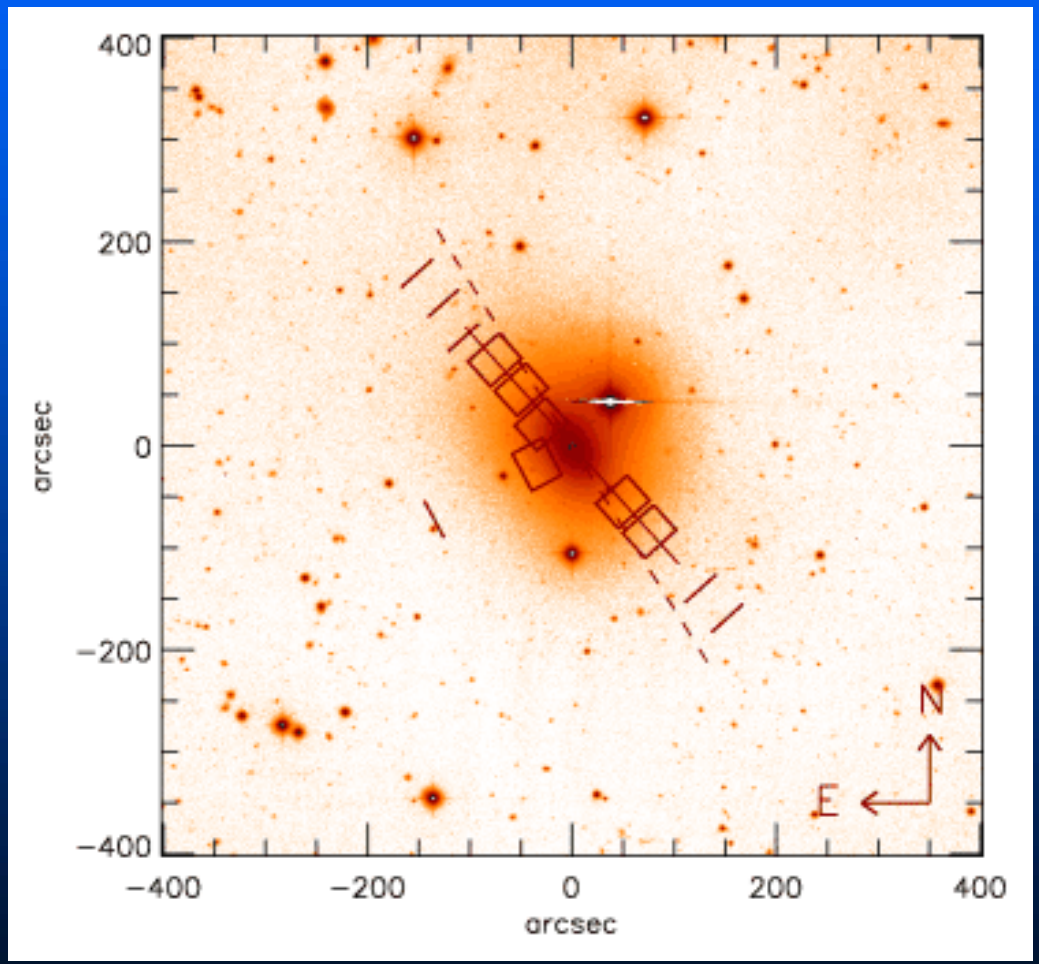
In collaboration with: M. Cappellari (Oxford), R. McDermid (Gemini), P.T. de Zeeuw (ESO/Leiden)

Gas and Stars in Galaxies: A Muli-Wavelength 3D Perspective
Garching, 10 June 2008

Dark matter in early-type galaxies

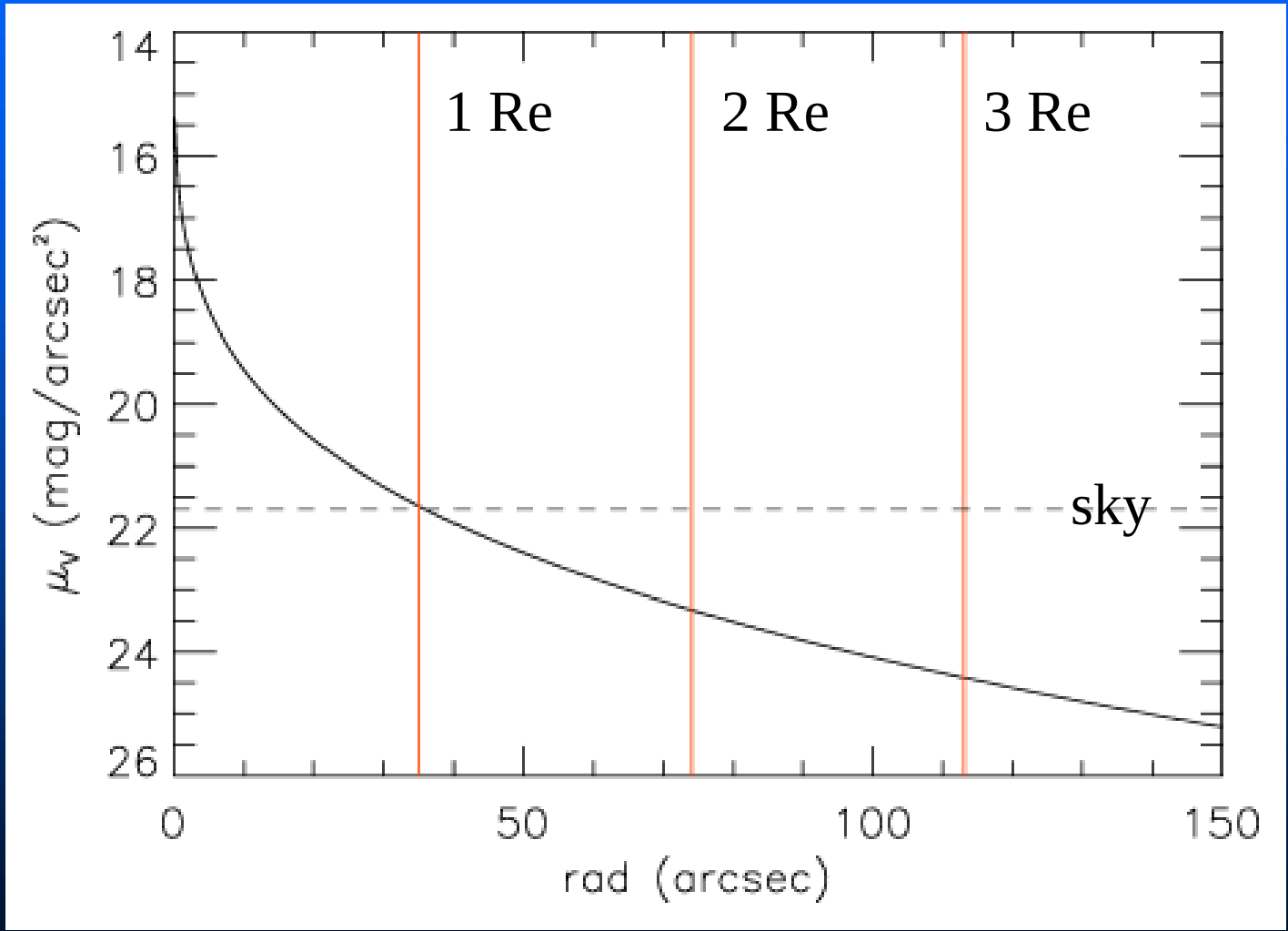
- HI rotation curves revealed DM haloes in spirals
- DM haloes in early-type galaxies less accessible
  - some HI rotation curves available (e.g. Oosterloo et al. 2002; Józsa et al. 2004; Weijmans et al. 2008)
  - integrated light stellar kinematics out to 1-2 R_e (Carollo et al. 1995; Kronawitter et al. 2000)
- Use other tracers of dark matter
  - globular clusters (Côté et al. 2003)
  - planetary nebulae (Romanowsky et al. 2003; Douglas et al. 2007)
  - X-ray emission (Paolillo et al. 2003)

NGC 821

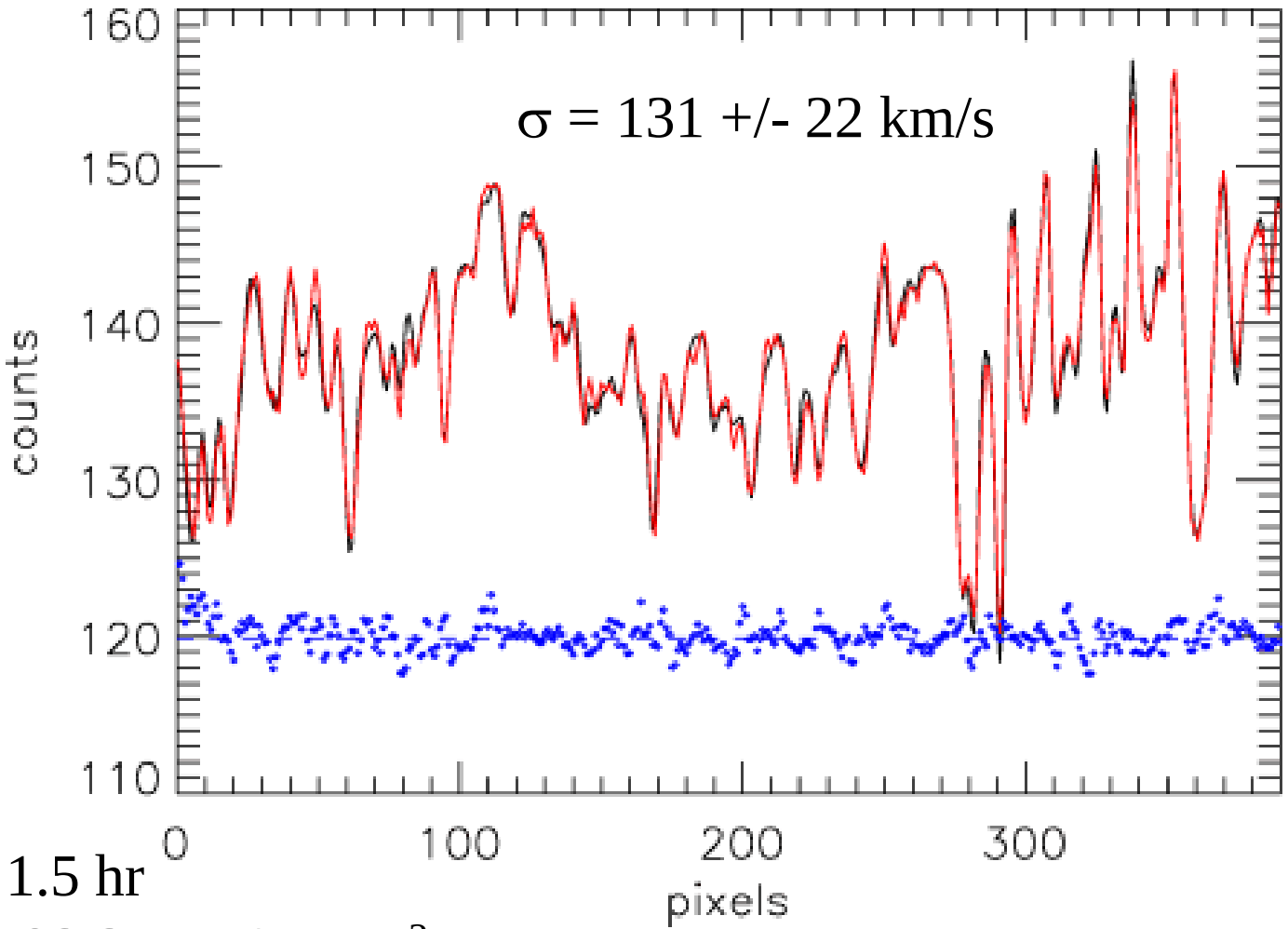


- E6 galaxy
- B = 11.3
- D = 23.4 Mpc
- R_e = 39” = 4.4 kpc

Surface brightness of NGC 821



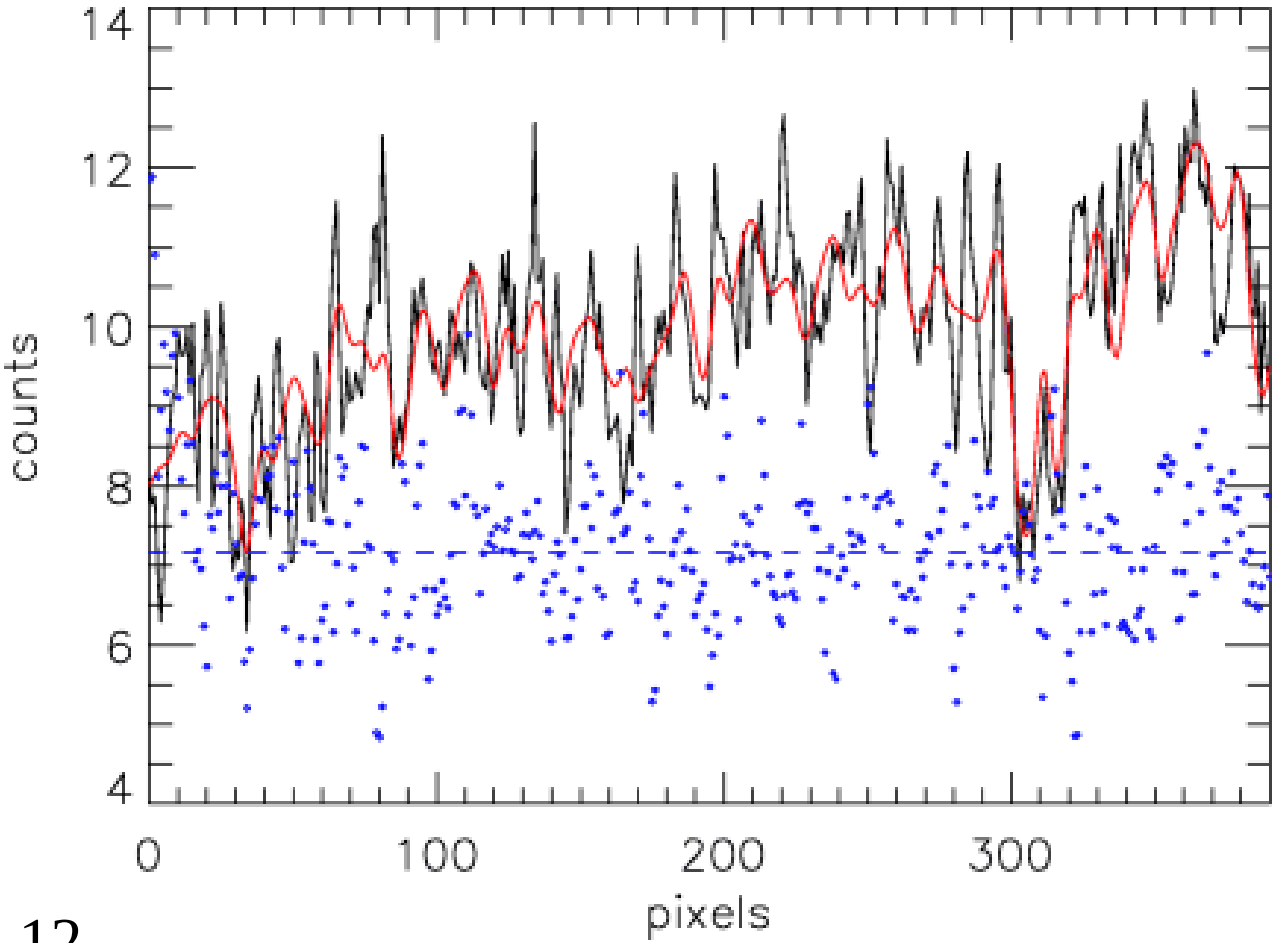
2 Re



T = 1.5 hr

$\mu_v \sim 23.3$ mag/arcsec^2

NGC 821 at 2 Re

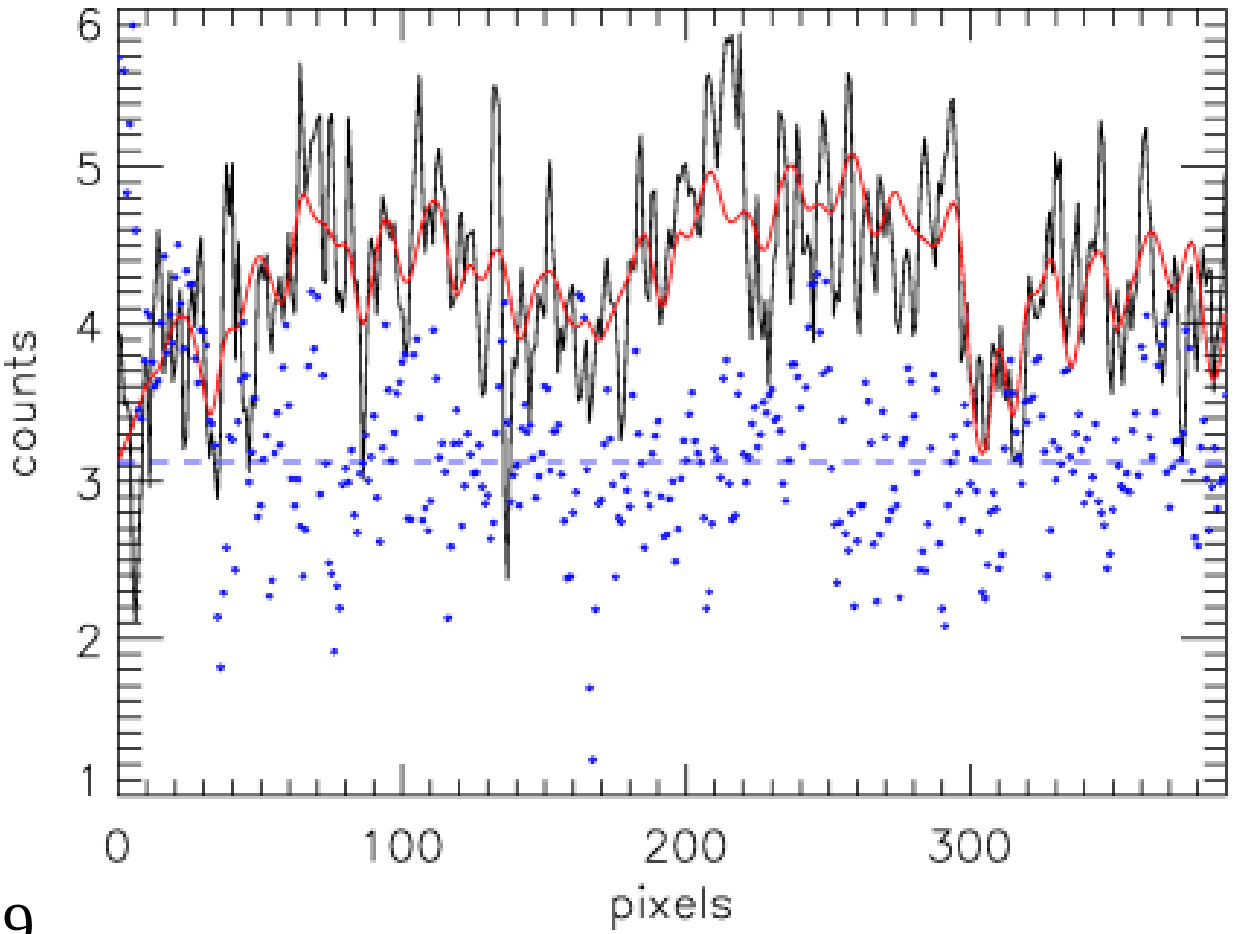


S/N = 12

galaxy = 7% of total signal

σ = 131 +/- 22 km/s

NGC 821 at 3 Re

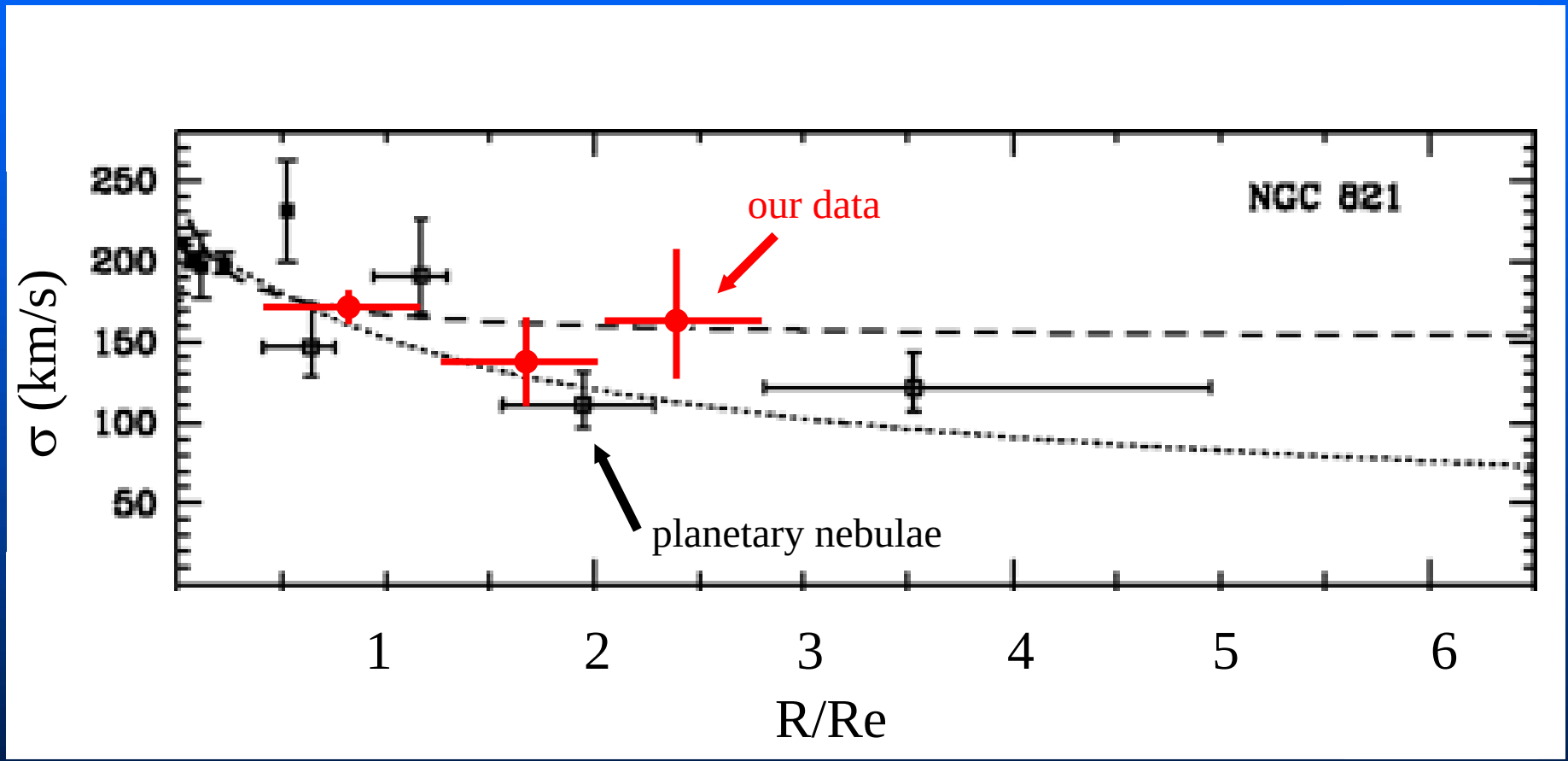


S/N = 9

galaxy = 4% of total signal

σ = 163 +/- 43 km/s

Comparison to PN.S



After Romanowsky et al. (2003)

Conclusions

- IFUs can provide stellar kinematics at large radii
  - important test for dark matter
- Measure line-strengths out to large radii
  - line strength gradients
- Also data out to 4 Re for early-type NGC 3379