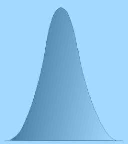
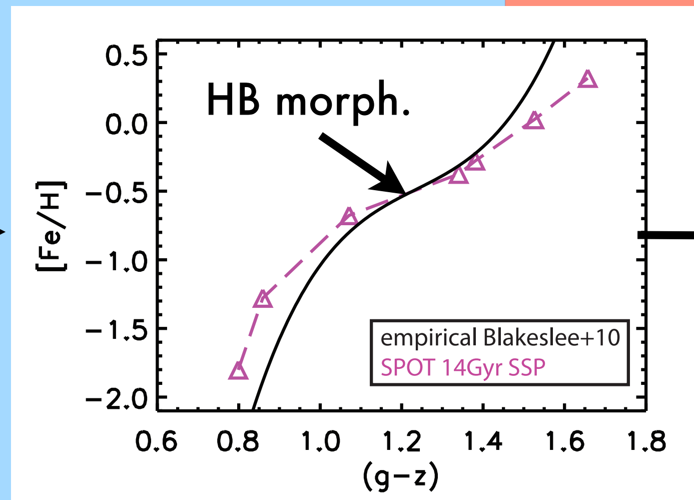
On the colour bimodality of GC systems

Chies-Santos+11c



[Fe/H]

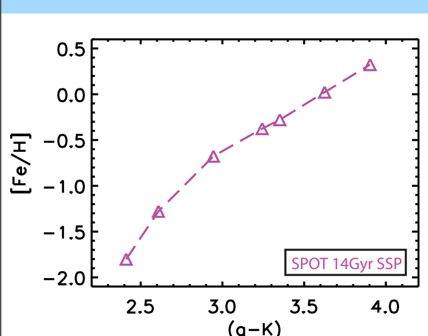
Yoon+06
Cantiello & Blakeslee 07



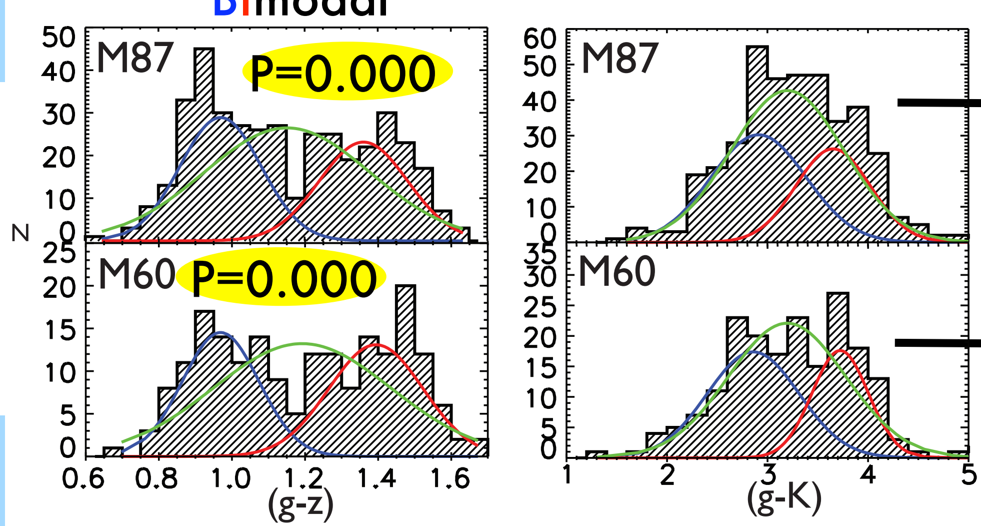
(g-z)

Ana L. Chies-Santos,
Larsen, Cantiello,
Strader, Kuntshner,
Wehner, Brodie

Optical/near-infrared colours ➜ better metallicity tracers, less influenced by HB



BImodal



UNImodal (g-k)

P=0.934

[Fe/H]

BImodal (g-k)

P=0.020

[Fe/H]

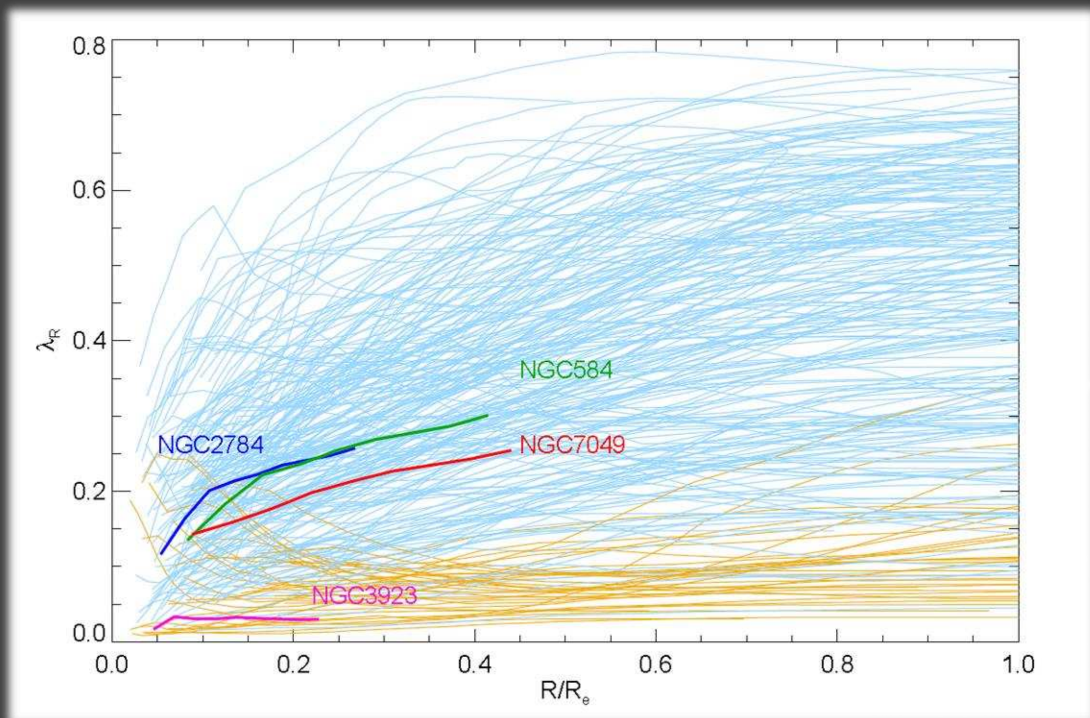
Colour bimodality does NOT necessarily indicate [Fe/H] bimodality!

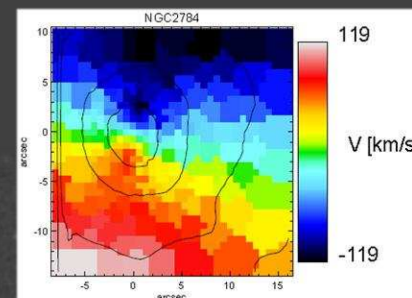
Ana L. Chies-Santos, Utrecht

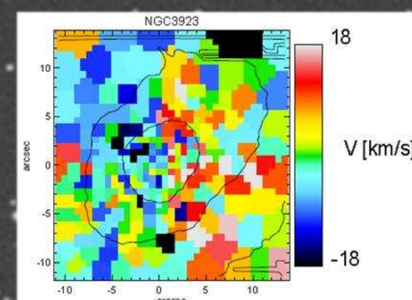
Stellar Populations and Kinematics of Early Type Galaxies

- a 2-D view with VLT/VIMOS

Carina Lagerholm, Harald Kuntschner, Davor Krajnović, Richard McDermid, Michele Cappellari



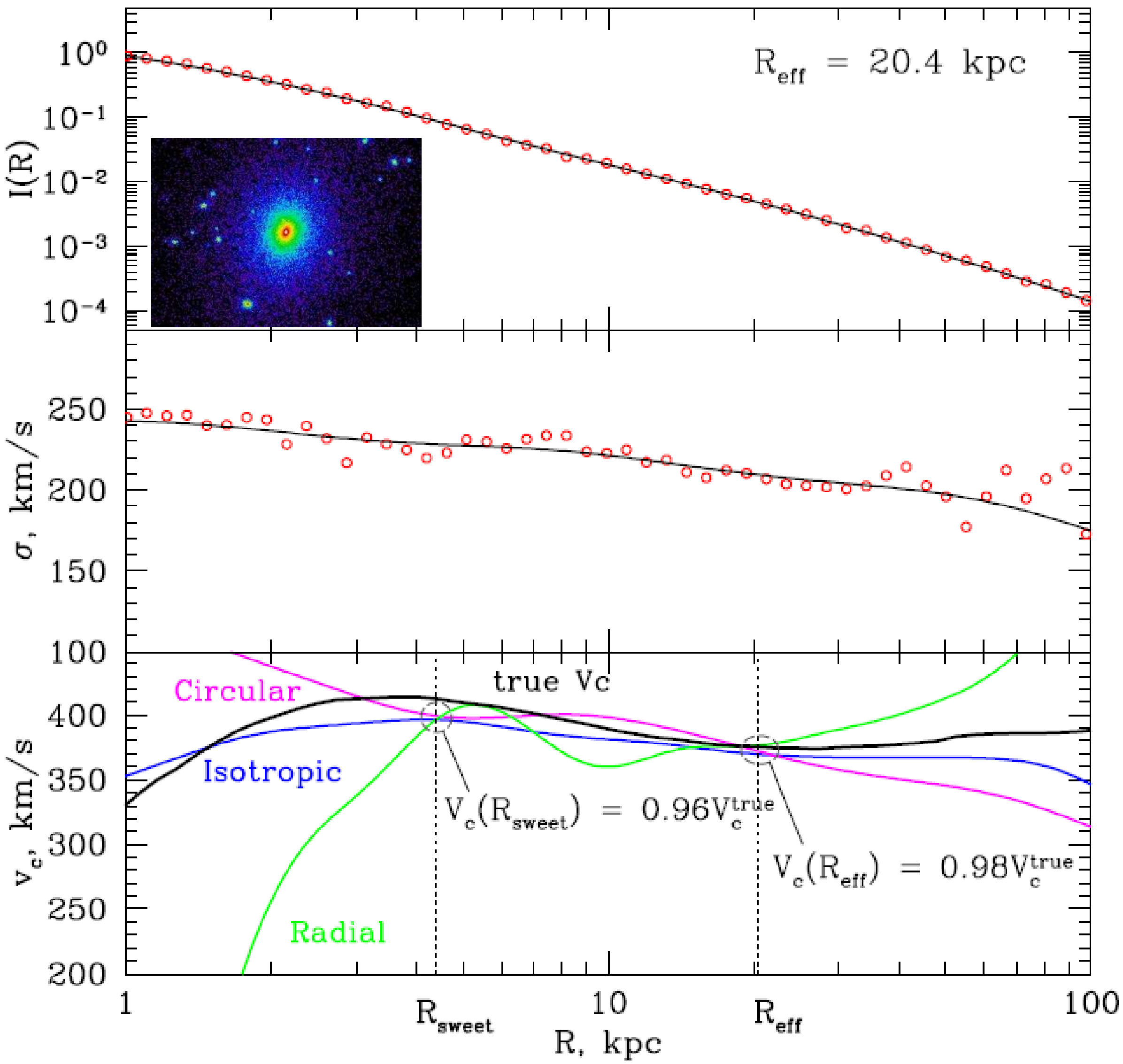




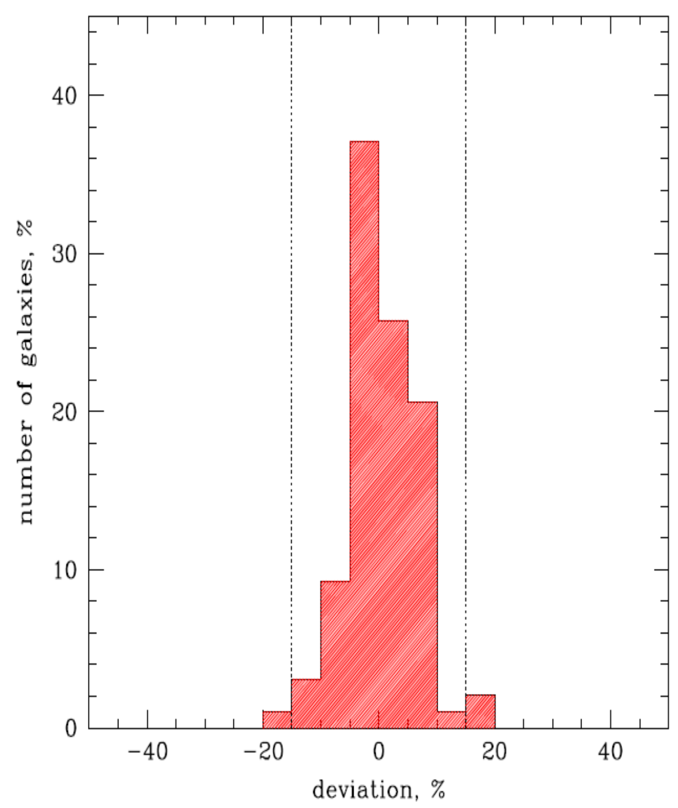
NGC2784 (Credit: UKSchmidt)

A simple recipe for estimating galaxy masses from minimal observational data.

Simulated galaxies from L. Oser et al. 2010



$$V_c = \sigma_{iso}\sqrt{-\frac{dlgI(R)}{dlgR} + 1}$$



N. Lyskova et al., MPA

NMAGIC PARTICLE MODELS OF ELLIPTICAL GALAXIES

Lucia Morganti, Ortwin Gerhard and the Dynamics group at MPE

NMAGIC dynamical models

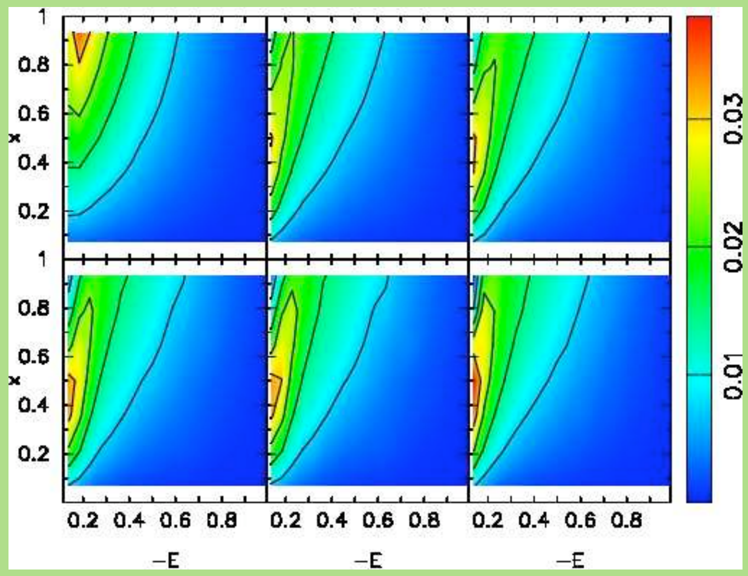
Aim: equilibrium particle models of stellar systems that reproduce observational data.

Force of Change acting on particle weights:

$$\frac{dw_i}{dt} = \varepsilon w_i(t)\left(\mu\frac{\partial S}{\partial w_i} - \sum_j \frac{K_j[\mathbf{z}_i(t)]}{\sigma(Y_j)}\Delta_j(t)\right)$$

Regularization — Difference model-target

Standard: flat priors in entropy
New: compute & update a smooth distribution of priors in phase-space



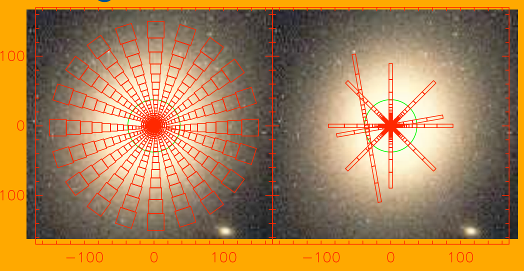
Smoother distribution of particle weights → smoother fit to the data

Uniqueness of the solution

Does the final solution depend on the initial particle model?

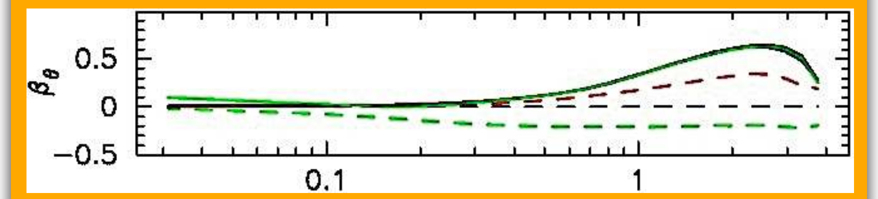
Truncated target covered by data

Infinite target with usual slit data



Truncated target: intrinsic properties recovered

- with high accuracy
- independent of initial model

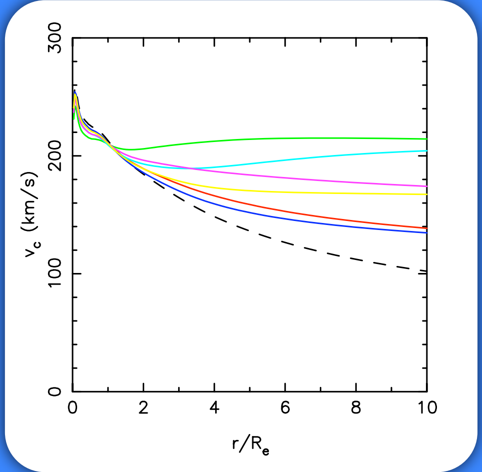


Infinite target: need for additional assumptions (see poster)

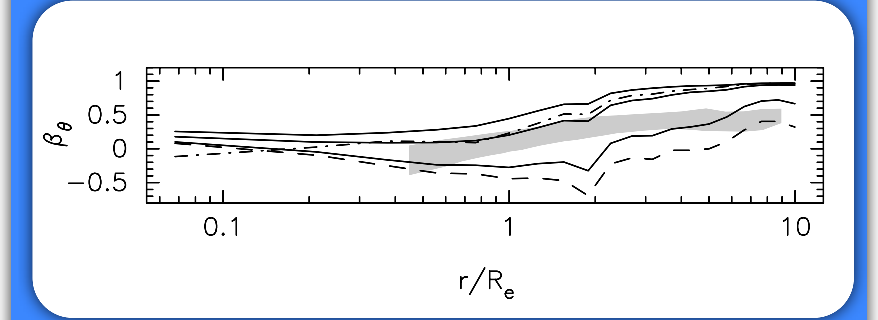
References: Syer & Tremaine 1996; de Lorenzi et al. 2007, 2008, 2009; Morganti & Gerhard 2011 (in prep)

DM and stellar halos of intermediate luminosity ellipticals

Method: construct NMAGIC models in different potentials. Use PNe as kinematic tracers of stellar VD at large radii.



Result so far: a range of DM potentials and orbital anisotropies are consistent with the data.



Goal: expand the sample of intermediate luminosity ellipticals. Are their halos similar?

The Spitzer [3.6] – [4.5] Colour in Early-type Galaxies

Colours, Colour Gradients and Scaling Relations

Reynier Peletier (Groningen) et al.

We present a study of [3.6]-[4.5] colours and colour gradients in the SAURON sample. We find that in this colour the emission of early-type galaxies is mostly stellar. Some of our main conclusions are:

- Local early-type galaxies display a tight inverted colour-velocity dispersion relation, with more massive galaxies showing bluer colours.

- Although we also find tight relations of [3.6] - [4.5] with mass and 3.6 μm luminosity, the latter are much more curved than the one with σ. This has to do with the mass distribution within the galaxies, and the fact that v/σ becomes larger for smaller galaxies. It looks as if stellar populations depend more on σ than on total mass.

- Deviations from the colour - σ relations, larger than the observational uncertainties, are seen. They are mostly due to young stellar populations.

- In the galaxies that contain compact radio sources, [3.6] - [4.5] is slightly redder than in other galaxies of the same mass.

- We obtained radial colour profiles and measured colour gradients Δ([3.6]-[4.5])/Δ log r for regions which can be represented by a single linear fit. Here colour gradients are generally positive, indicating that galaxies are redder going outwards, or slighty more metal poor.

- The spread in gradients, especially for more massive galaxies, indicates the importance of both monolithic collapse and mergers in the formation and evolution of early type galaxies.

- Boxy galaxies have smaller gradients than disky ones. This is probably due to the dilution due to low angular momentum orbits in the former.

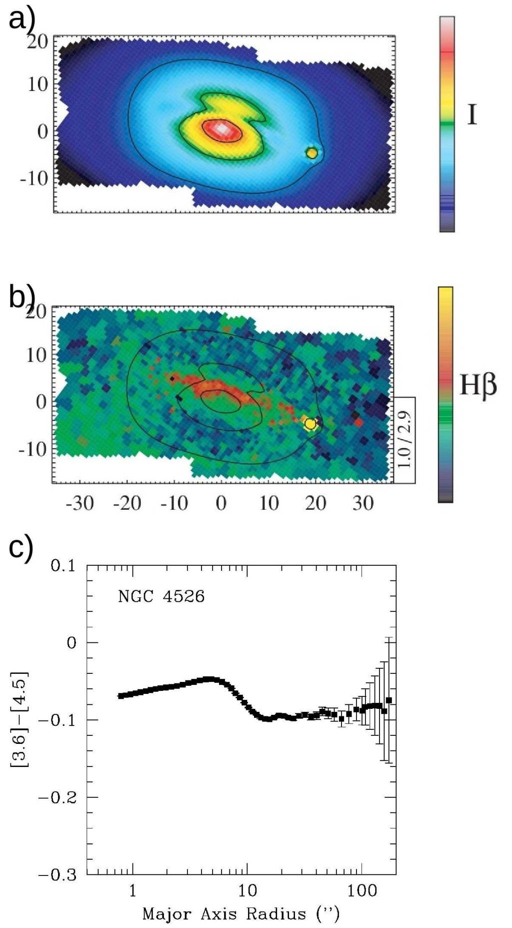


Fig. 1: SAURON images in the V-band continuum (a) and in the Hβ absorption line (b) of NGC 4526. At the bottom a radial [3.6]-[4.5] profile of this galaxy. The central, redder, part of the profile corresponds exactly to the disk seen in the upper 2 panels.This galaxy shows nicely that younger stellar populations cause this colour to redden in the central regions.

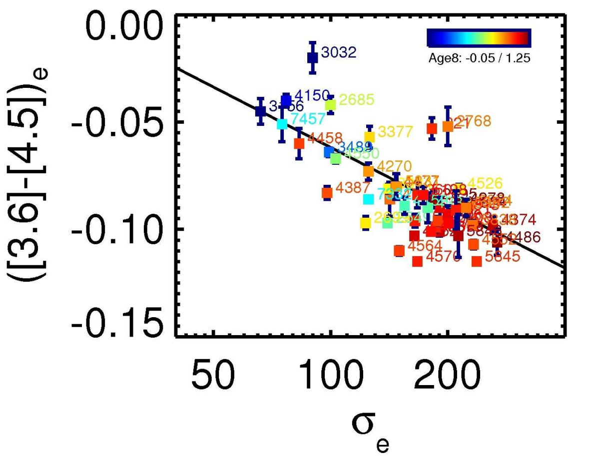
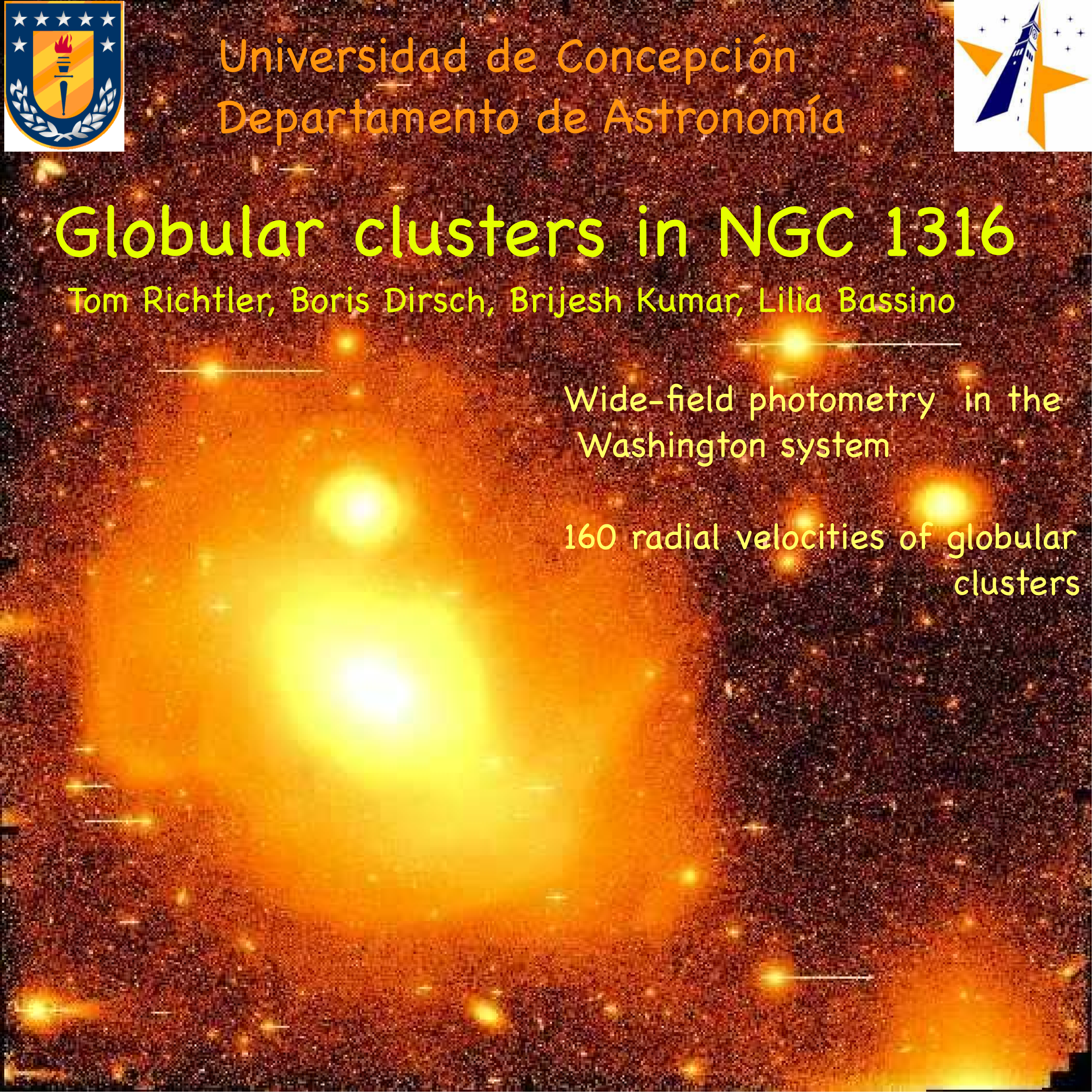
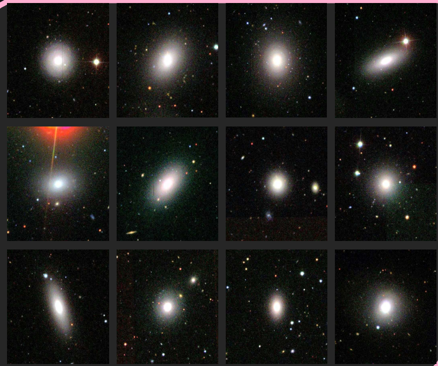


Fig. 2: [3.6]-[4.5] colour as a function of velocity dispersion inside r_e. The points have been colour coded according to the age inside $r_e/8$. Note that more massive galaxies are bluer.


Universidad de Concepción
Departamento de Astronomía
Globular clusters in NGC 1316
Tom Richtler, Boris Dirsch, Brijesh Kumar, Lilia Bassino
Wide-field photometry in the Washington system
160 radial velocities of globular clusters

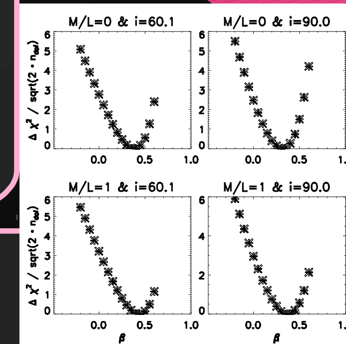
Dwarf elliptical galaxies in the Virgo Cluster - a SAURON perspective

Agnieszka Ryś, Jesús Falcón-Barroso (IAC, Spain), Glenn van de Ven (MPIA, Germany)



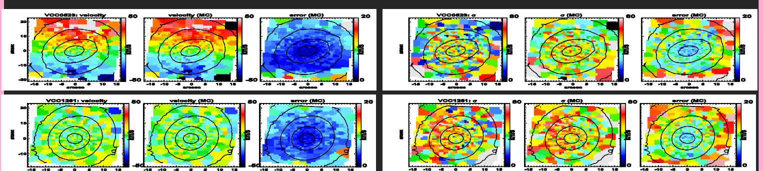
Overview of the study

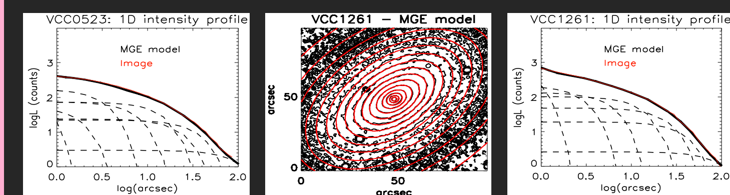
- sample: 9 Virgo bright, nucleated dEs and 3 field galaxies,
-V maps reveal features such as kinematic and photometric axes misalignment or significant flattening coupled with no observable rotation.
- have obtained age, *Z* & abundance estimates and compared them with those of Virgo giant ellipticals from the SAURON project.
- creating dynamical models: to investigate the possible peculiarities in the orbital structures
- here: initial results for 2 dEs from **axisymmetric Jeans models**, which allow us to obtain intrinsic mass profiles.

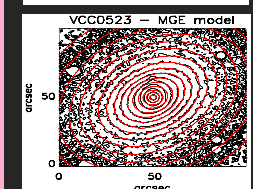


Results

stellar absorption line kinematics obtained with **ppxf** (Cappellari & Emsellem, 2004); MC simulations run to get errors

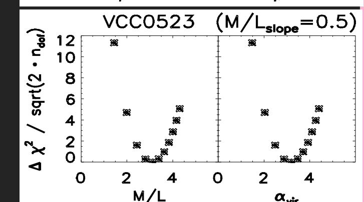




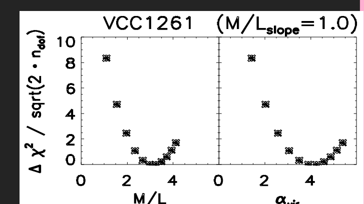


multi-gaussian expansion models (Cappellari 2002): image/model fits + 1D intensity profiles

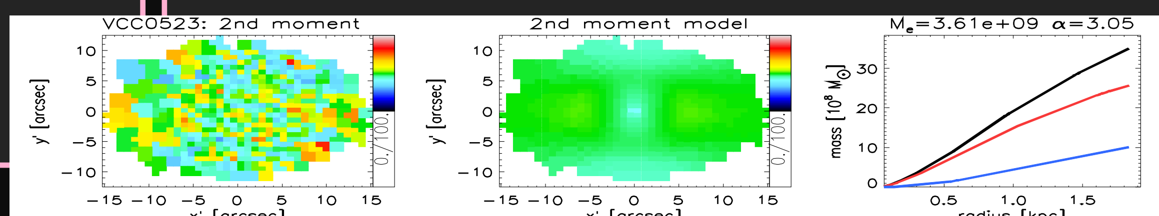
best-fit value of anisotropy β nearly independent of inclination and slope in the adopted linear *M/L* profile, **positive values for both β and the *M/L* slope are preferred.**

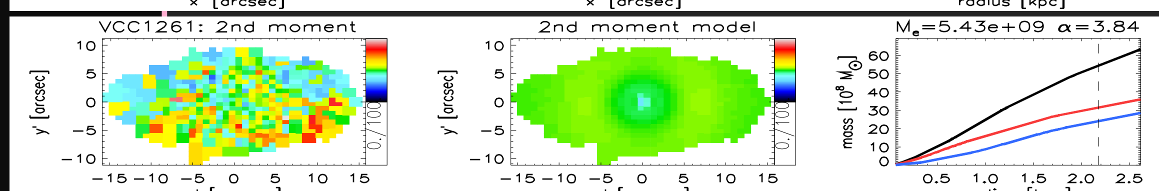


fairly large positive β found for systems like VCC1261 can explain their flattening combined with the apparent lack of rotation.
high β & lack of strong rotation → both objects are likely to be highly anisotropic.



estimates of *M/L* slopes, are ~0.2 and ~0.9 for VCC0523 and VCC1261, respectively, similar to those found for giant systems
- are yet to determine if the *M/L* slope from stellar populations can or cannot account for the full (dynamical) *M/L* slope found from our models.



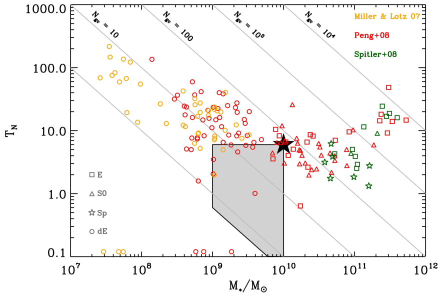


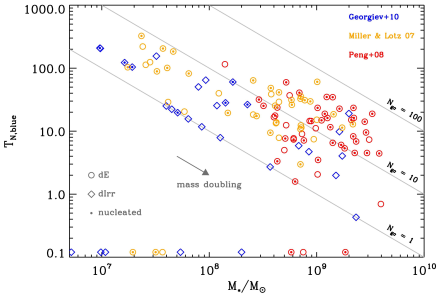
Future work

- investigate: simple, robust virial mass estimate possible if kinematics information is limited?
- use Schwarzschild's orbit-superposition technique to get a more flexible set of models

Globular cluster systems and the origin of dEs in Virgo

R. Sánchez-Janssen (ESO) & J.A.L. Aguerri (IAC)





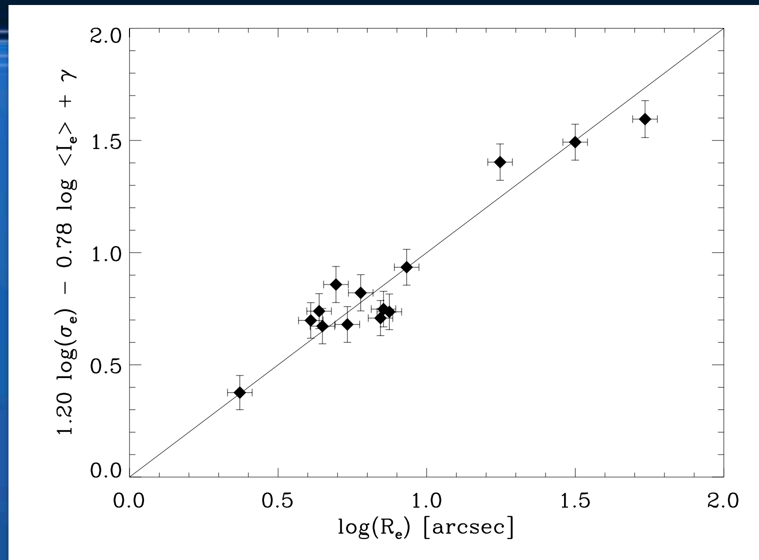
Evolution through harassment can not reproduce the high GC specific frequencies of Virgo dEs.

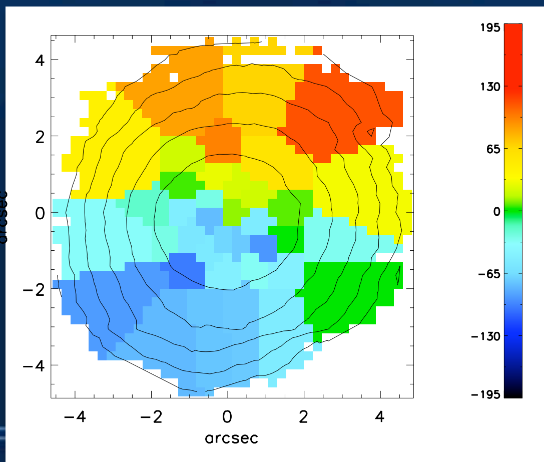
dEs have richer GCSs with a more extended spatial distribution than dIrrs.

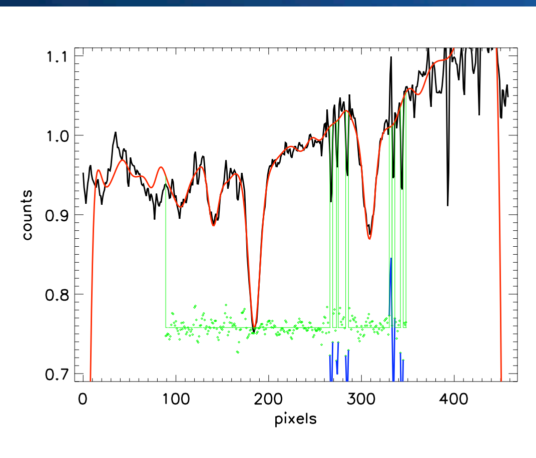
An IFU view of ETGs in the Coma cluster

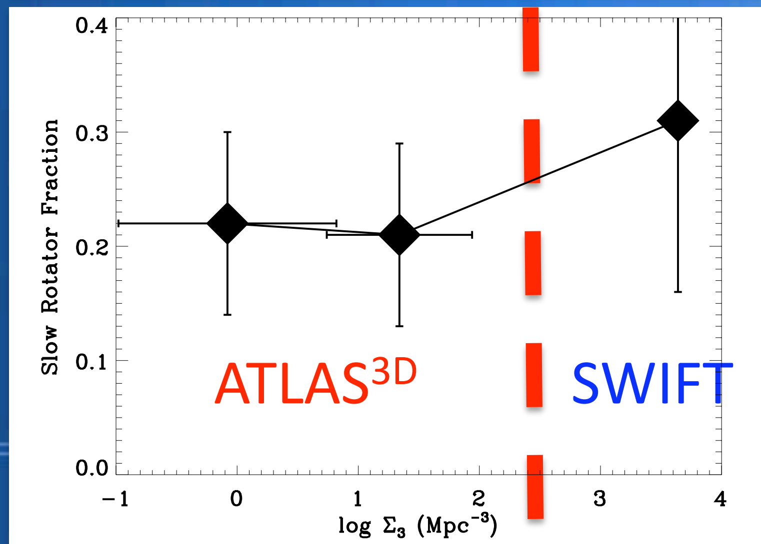
Nicholas Scott et al.

- IFU study of Coma ETGs using the SWIFT i- and z-band IFU.
- Complement the ATLAS[3D] survey by IFU observations + kinematics of ETGs in a high-density environment.
- Determine the FP in Coma using the true σ_e from 2D spectroscopy.



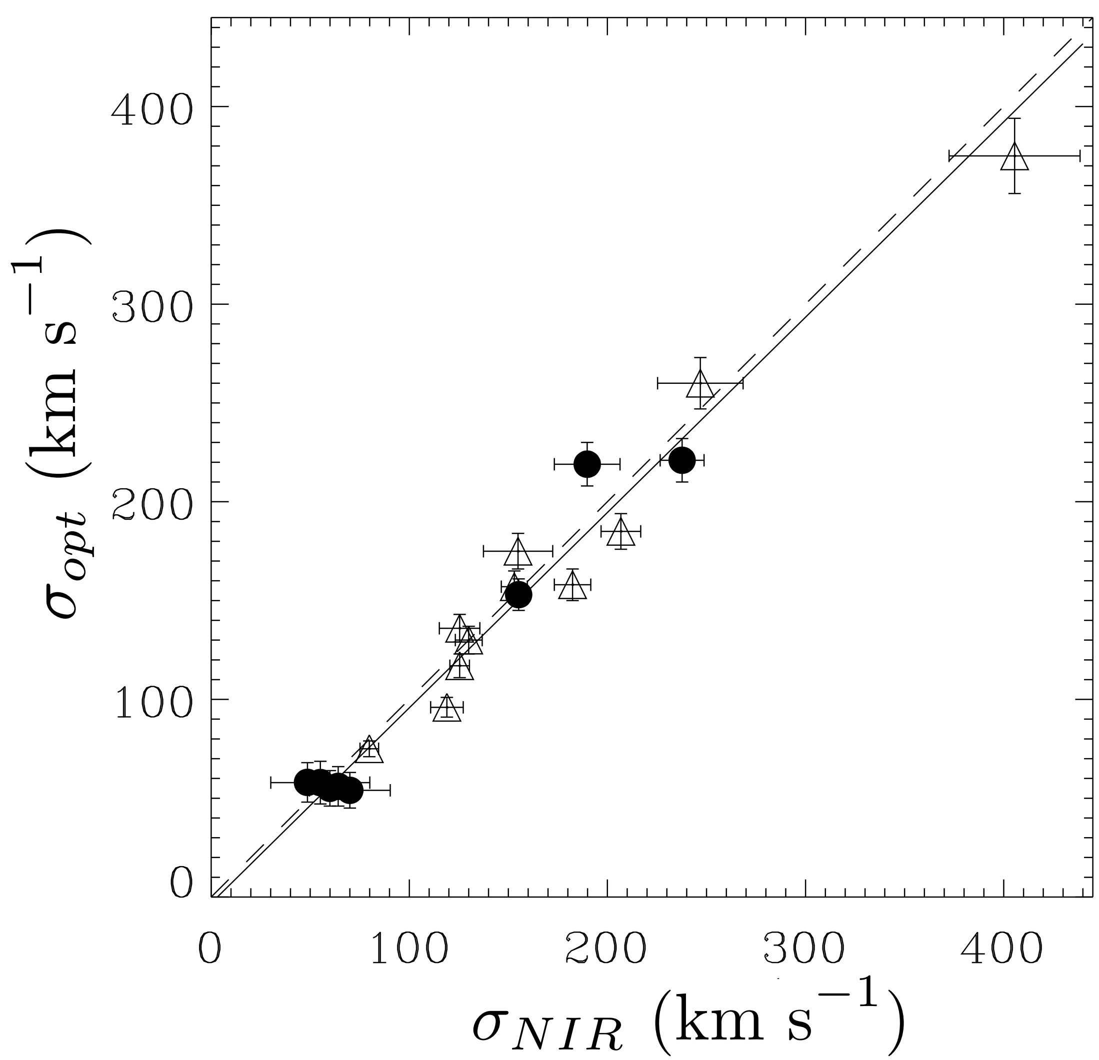


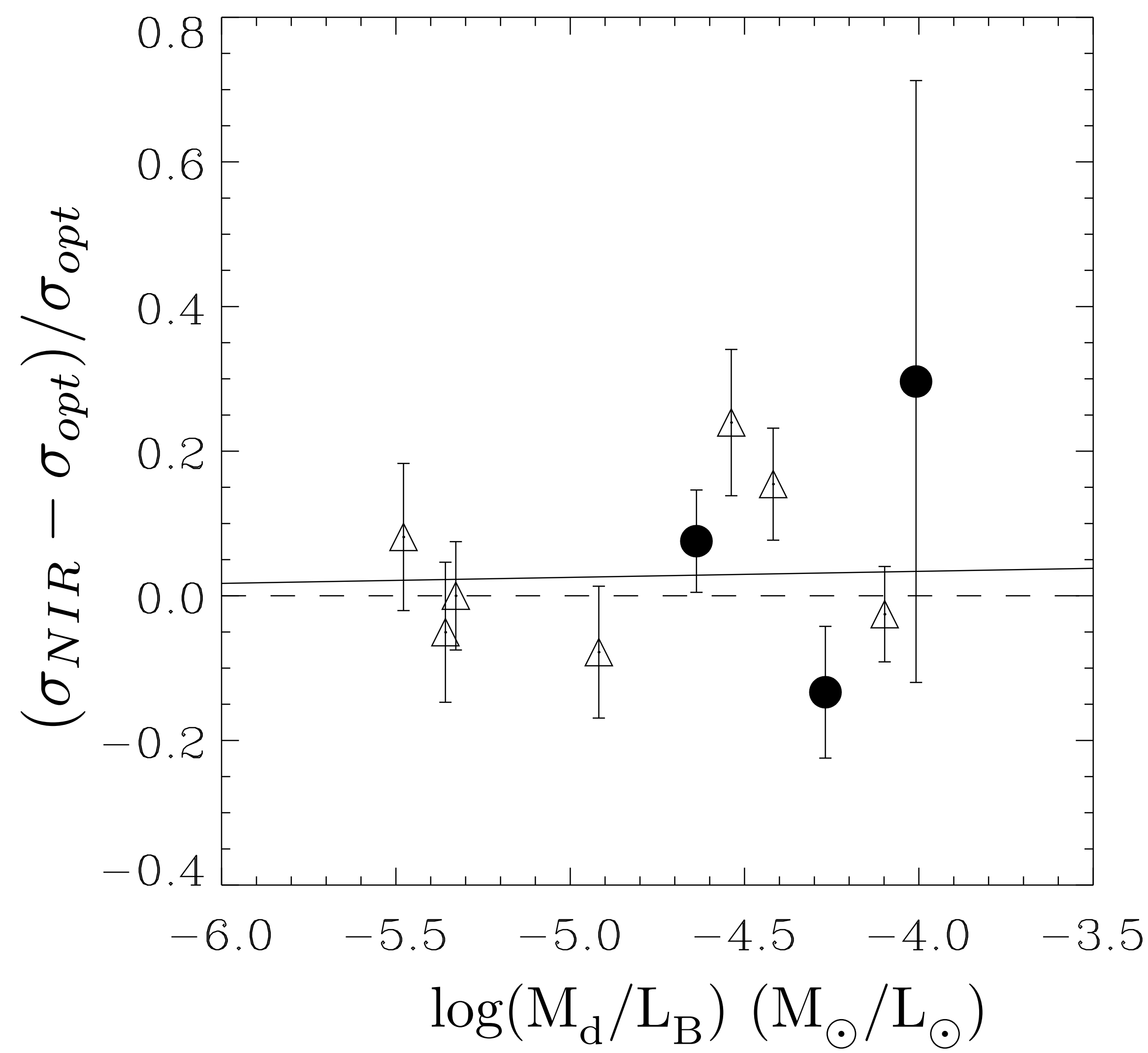




Our study on early-type galaxies in Fornax shows no sigma-discrepancy.

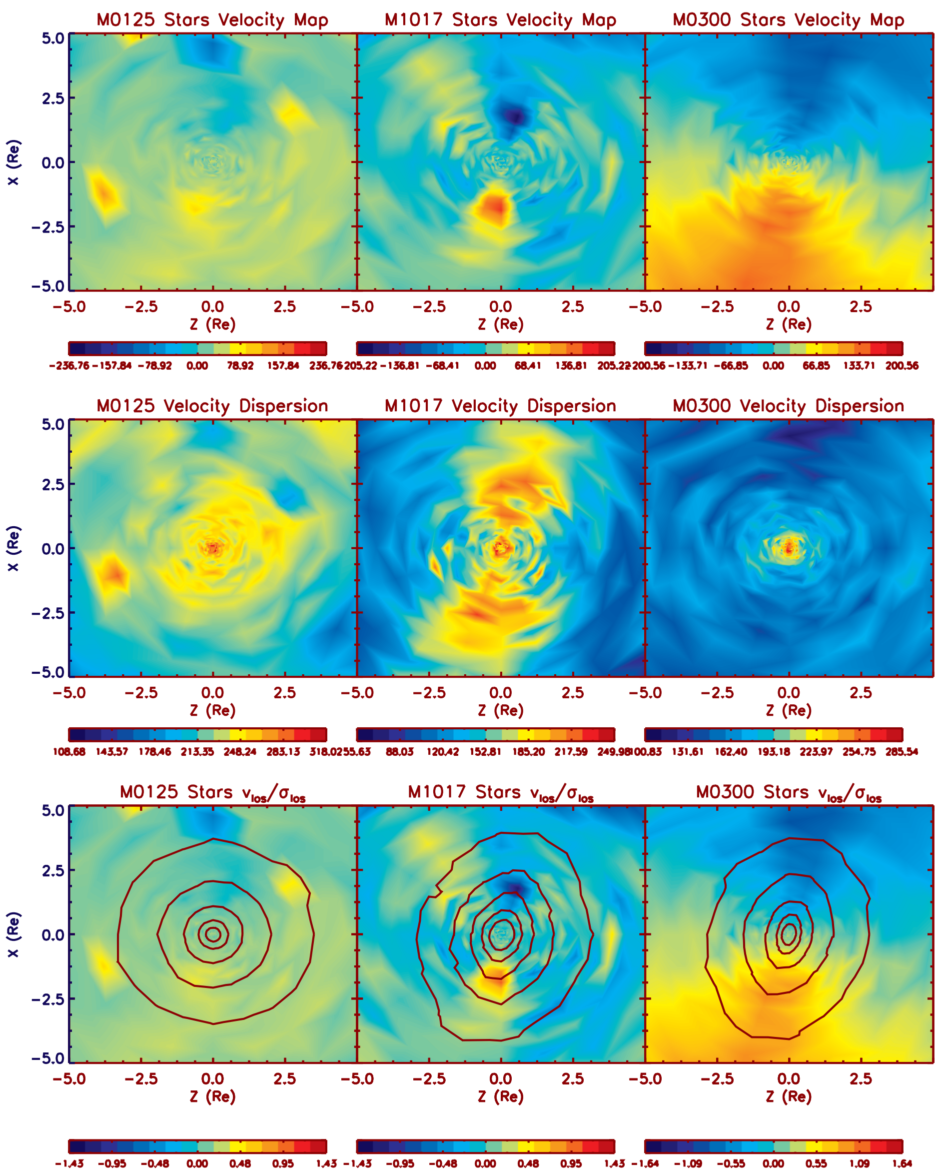
Vanderbeke et al. (2010, MNRAS, 412, 2017)

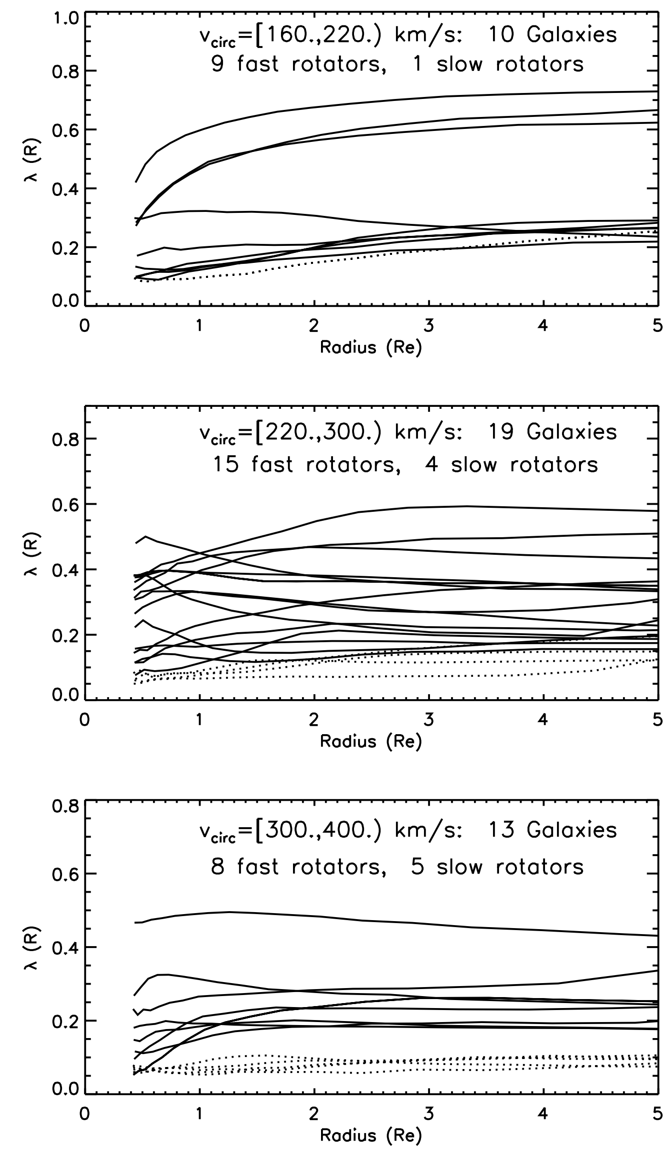


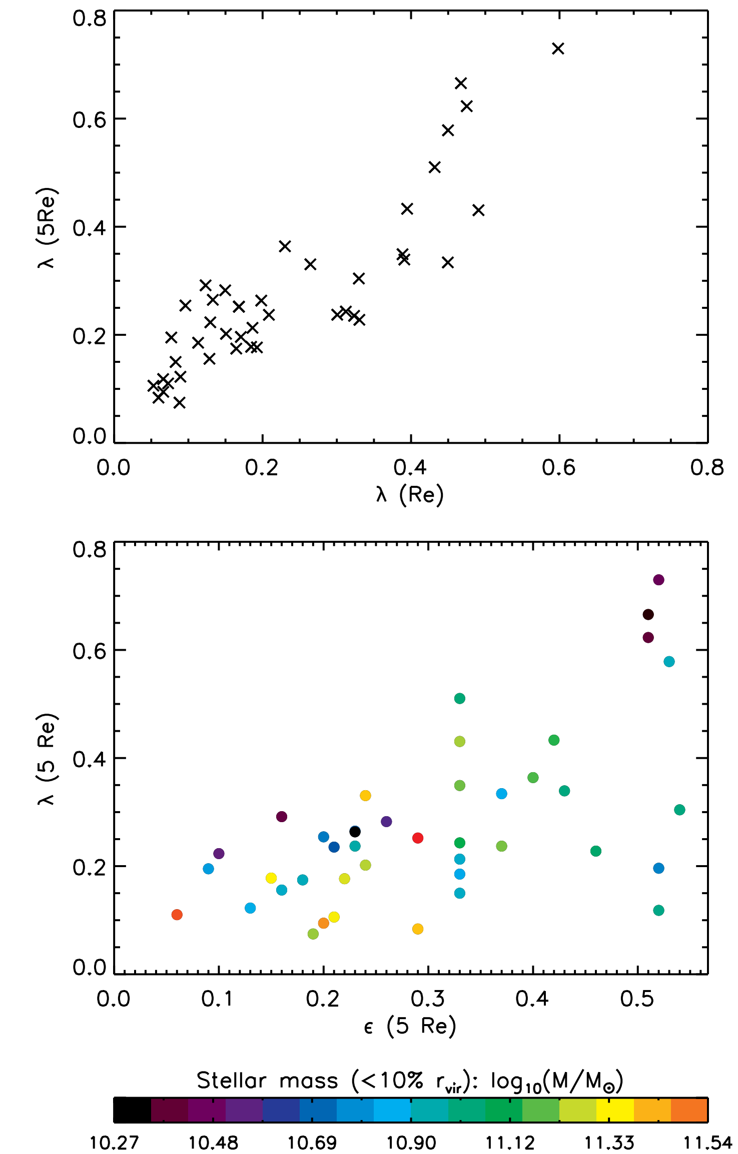


The Line-of-Sight Kinematics of Low Redshift Cosmological Galaxies

Xufen Wu, Ortwin Gerhard (@MPE), Michael Hilz, Thorsten Naab (@MPA)







- Among 42 galaxies, ~ 75% of them are intrinsically fast rotators (edge-on view) and the rest are slow rotators.
- The massive galaxies are rounder and rotate slower, whereas the small galaxies are flatter and rotate faster.
- Most λ profiles are almost flat from 2Re to large radii: stellar halo rotations correlates with central rotations.