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The low dark matter content of the lenticular galaxy NGC 3998

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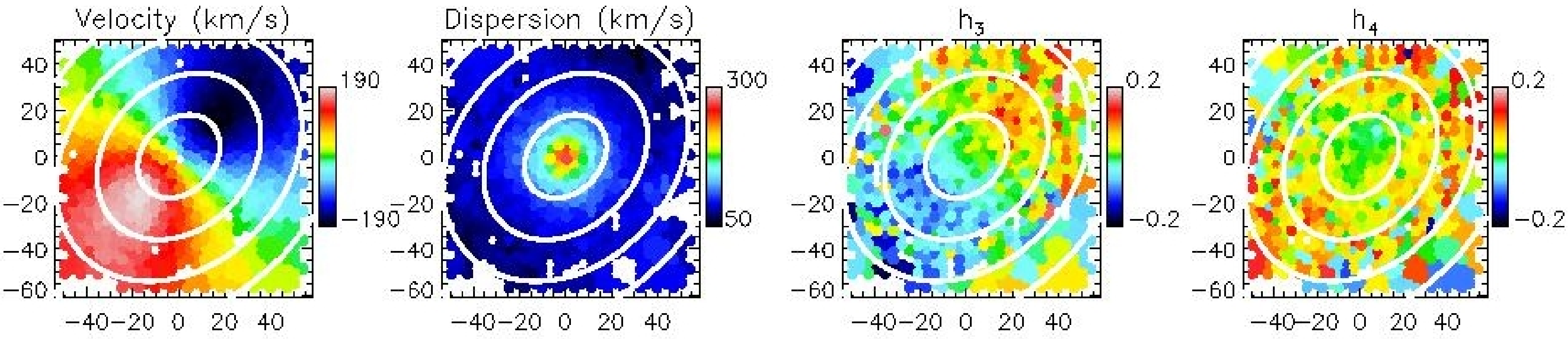
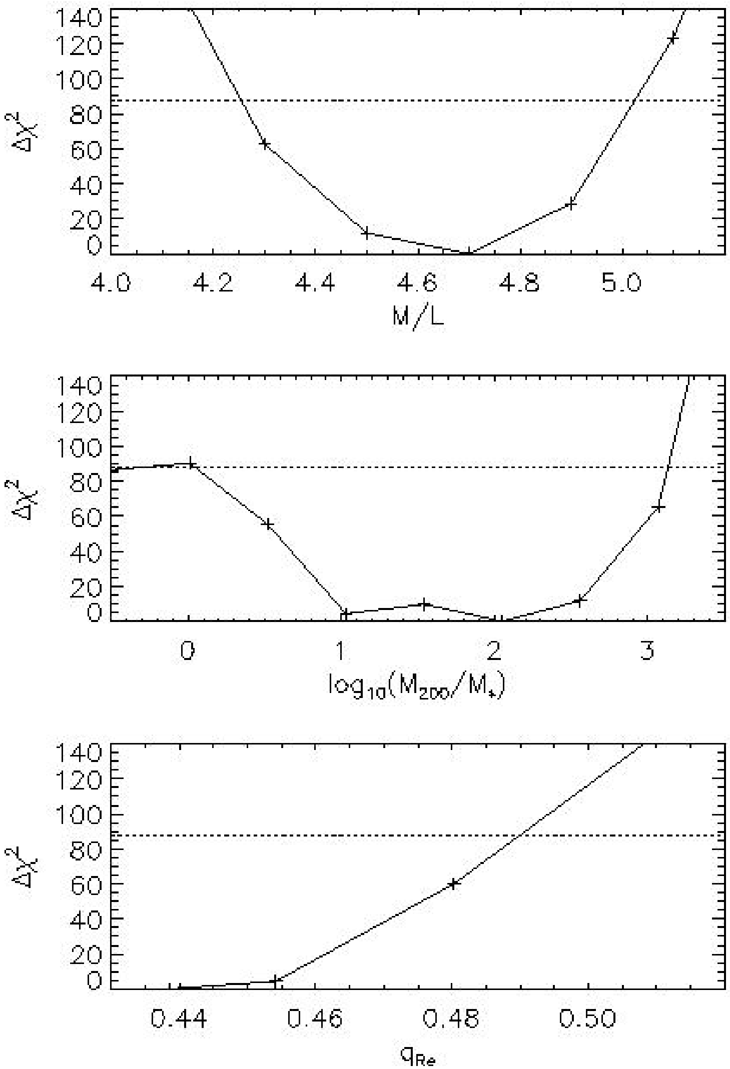
ABSTRACT

We observed the lenticular galaxy NGC 3998 with the Mitchell Integral-Field Spectrograph and extracted line-of-sight velocity distributions out to 3 half-light radii. We constructed collisionless orbit models in order to constrain NGC 3998's

Данные NGC 3998



Fitting



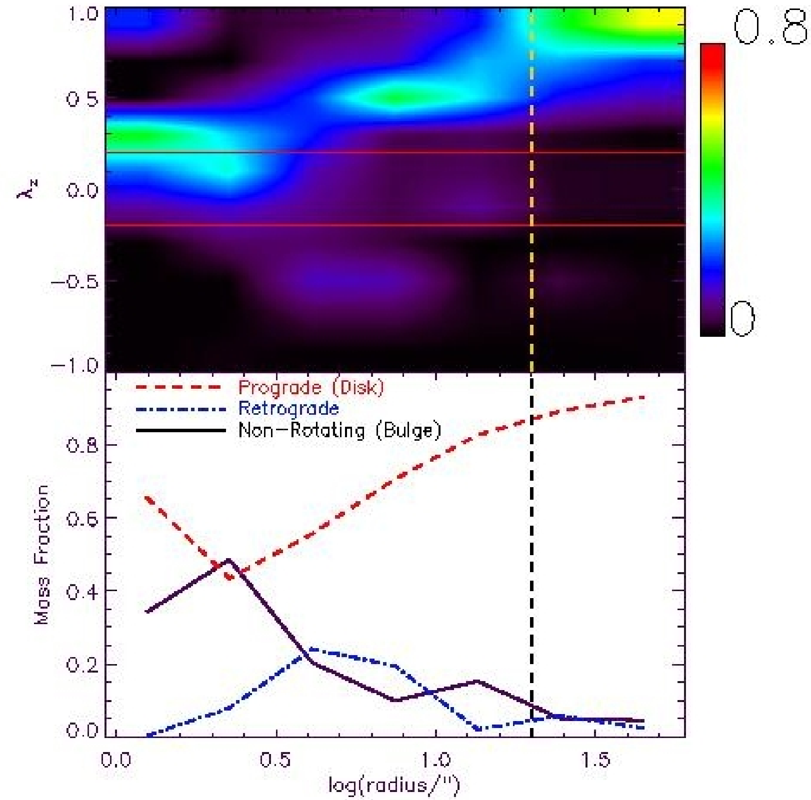


Figure 19. Mass distribution of orbits for the best-fitting orbit model, plotted as a function of average radius and spin. The distribution on the top panel is normalised per unit radius The vertical dashed lines mark 1 R_e. A bulge-disc separation is

Результаты

Model	q	M/L	$\log_{10}\left(\frac{M_{200}}{M_*}\right)$	$f_{DM}(R_{e,circ})$
Best fit	0.06	4.7	2.05	7.1%
DM-heavy	0.06	4.1	3.58	20.2%
DM-free	0.22	4.9	N/A	0%

Table 2. Summary of the three models shown in Figures 13-16 and discussed in the text. $f_{DM}(R_{e,circ})$ denotes the dark fraction within one (circularised) effective radius.

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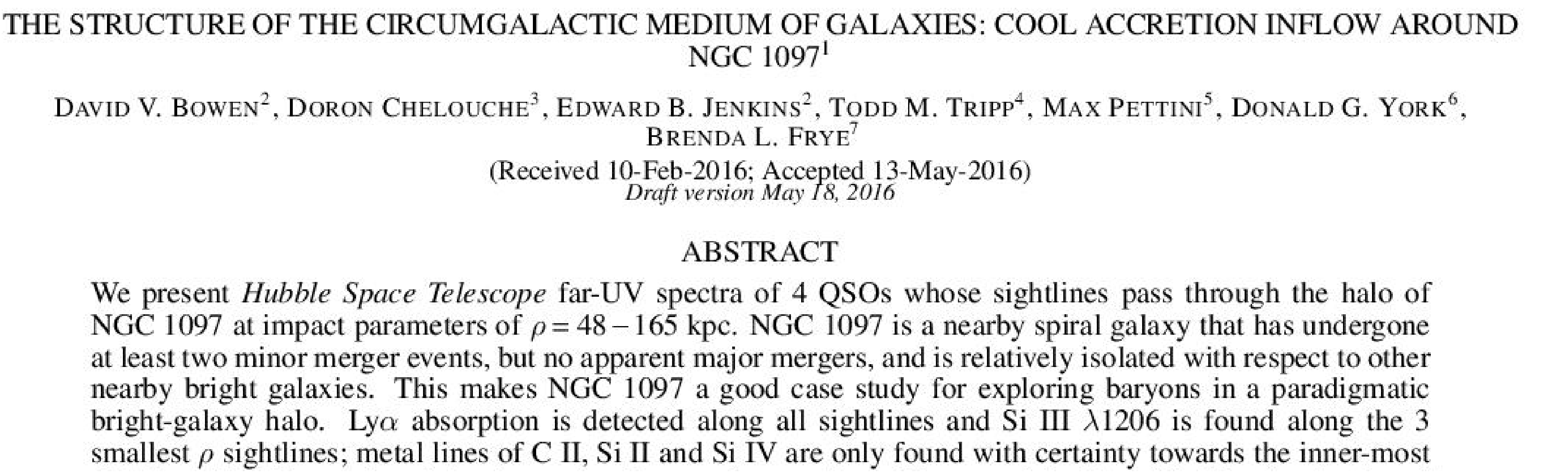
THE STRUCTURE OF THE CIRCUMGALACTIC MEDIUM OF GALAXIES: COOL ACCRETION INFLOW AROUND NGC 1097[1]

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ABSTRACT

We present *Hubble Space Telescope* far-UV spectra of 4 QSOs whose sightlines pass through the halo of NGC 1097 at impact parameters of $\rho = 48 - 165$ kpc. NGC 1097 is a nearby spiral galaxy that has undergone at least two minor merger events, but no apparent major mergers, and is relatively isolated with respect to other nearby bright galaxies. This makes NGC 1097 a good case study for exploring baryons in a paradigmatic bright-galaxy halo. Lyα absorption is detected along all sightlines and Si III λ1206 is found along the 3 smallest ρ sightlines; metal lines of C II, Si II and Si IV are only found with certainty towards the inner-most

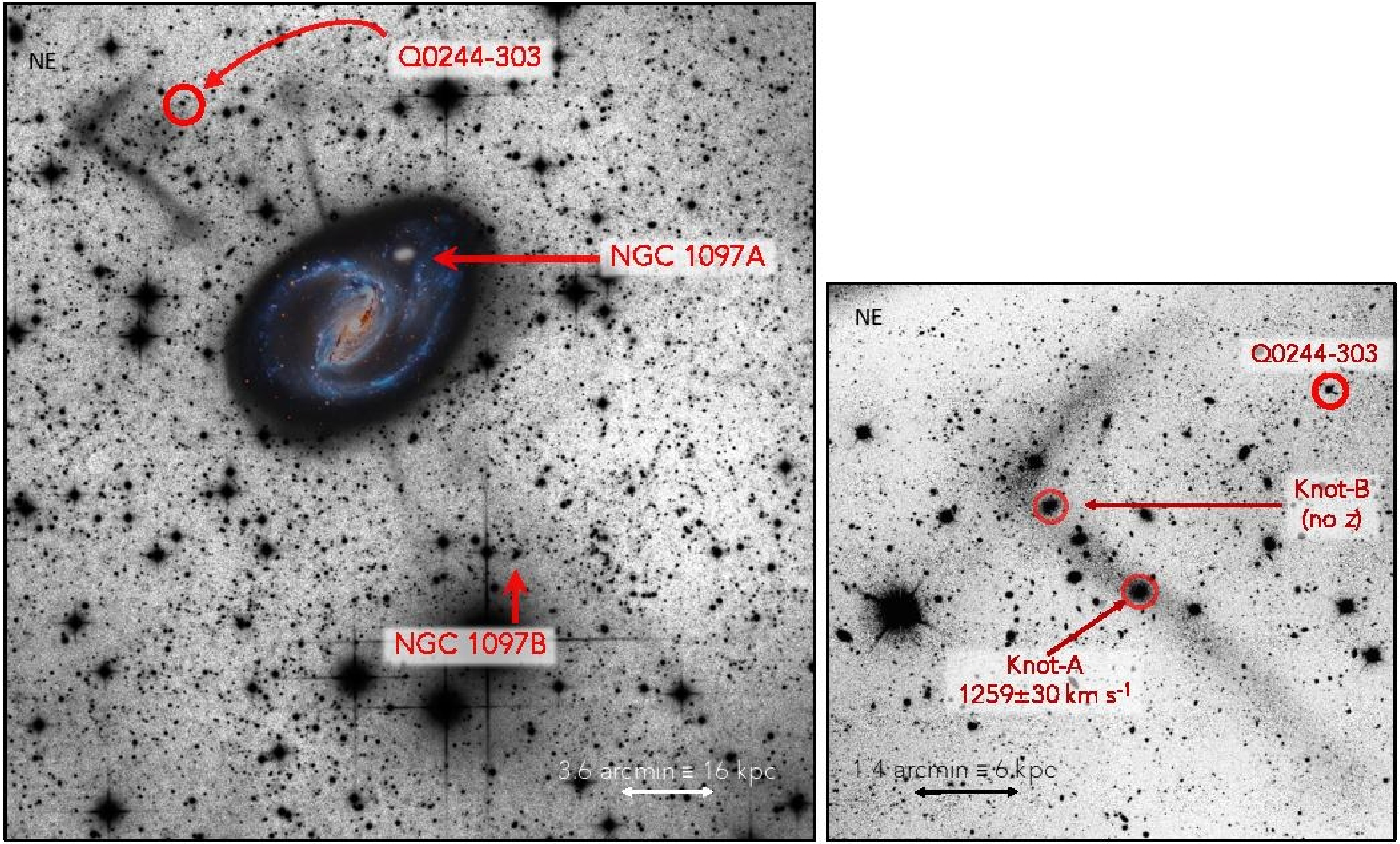
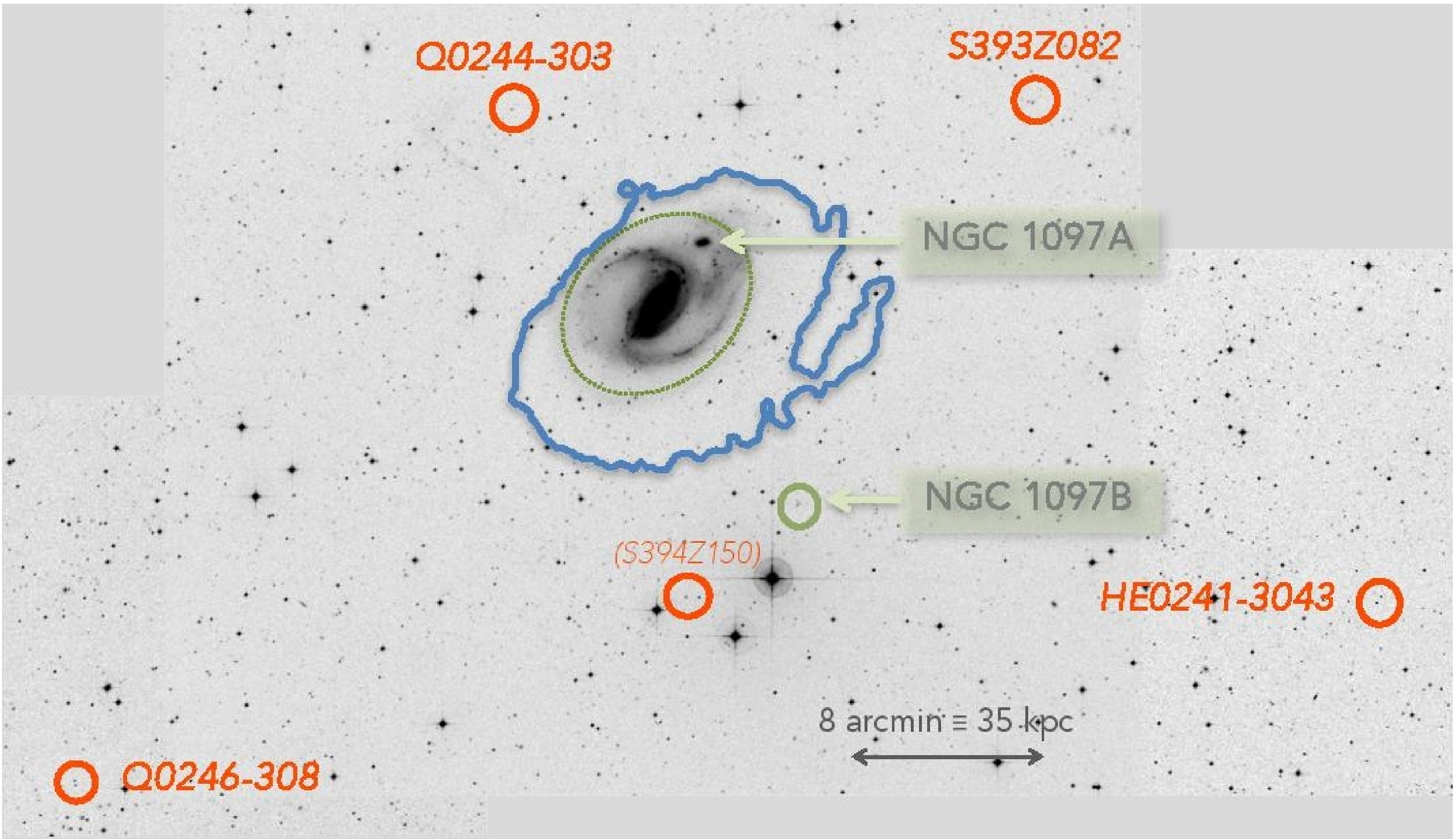
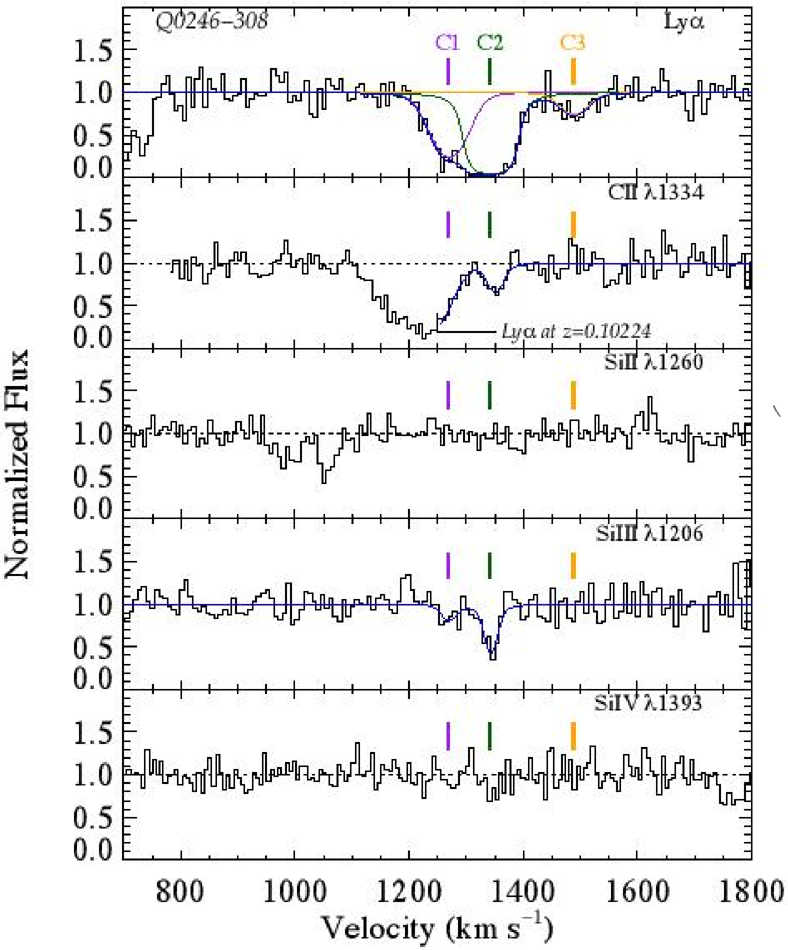
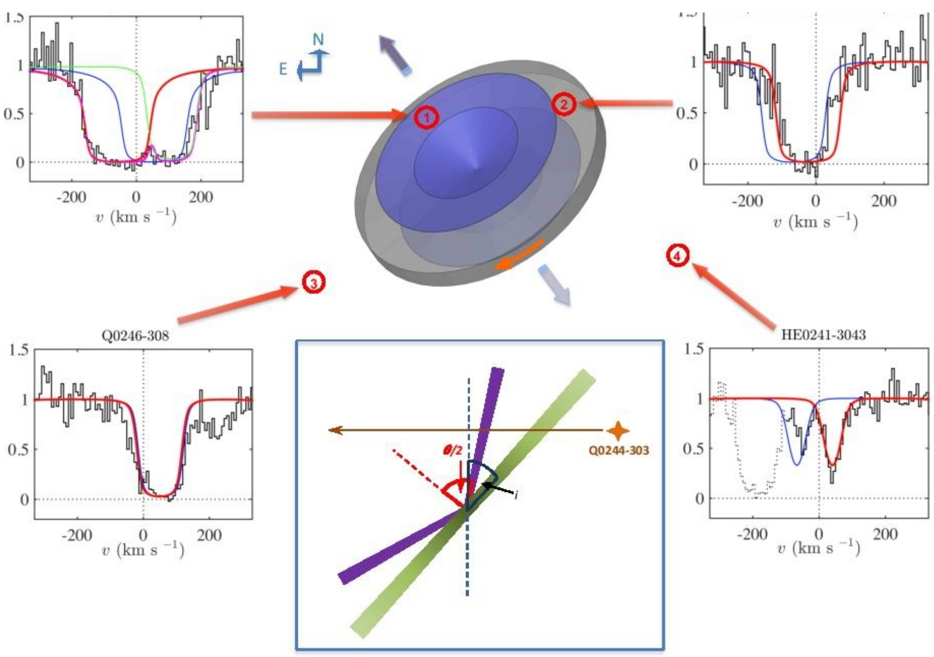


Figure 1. The field of NGC 1097 ($cz = 1270$ km s^{-1}), showing its stellar tidal streams. **Left:** Part of a multicolor (22 hr total) composite image of the galaxy


Q0244-303
S393Z082
NGC 1097A
NGC 1097B
(S394Z150)
HE0241-3043
8 arcmin ≡ 35 kpc
Q0246-308

Линии на просвет, кинематика





Вращение и модели

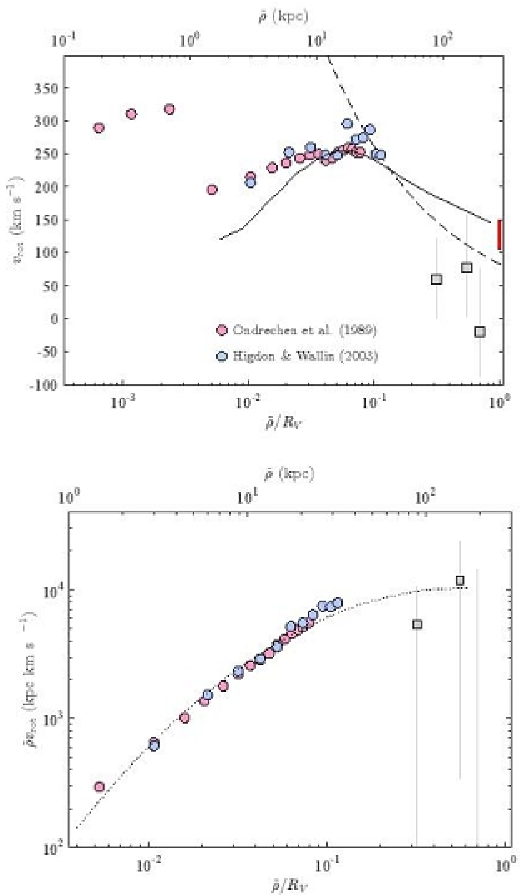


Figure 15. *Top:* Rotation curve for NGC 1097's inner disk from 21 cm data (pink and blue circles), compared to the absorbers in the CGM (grey squares)

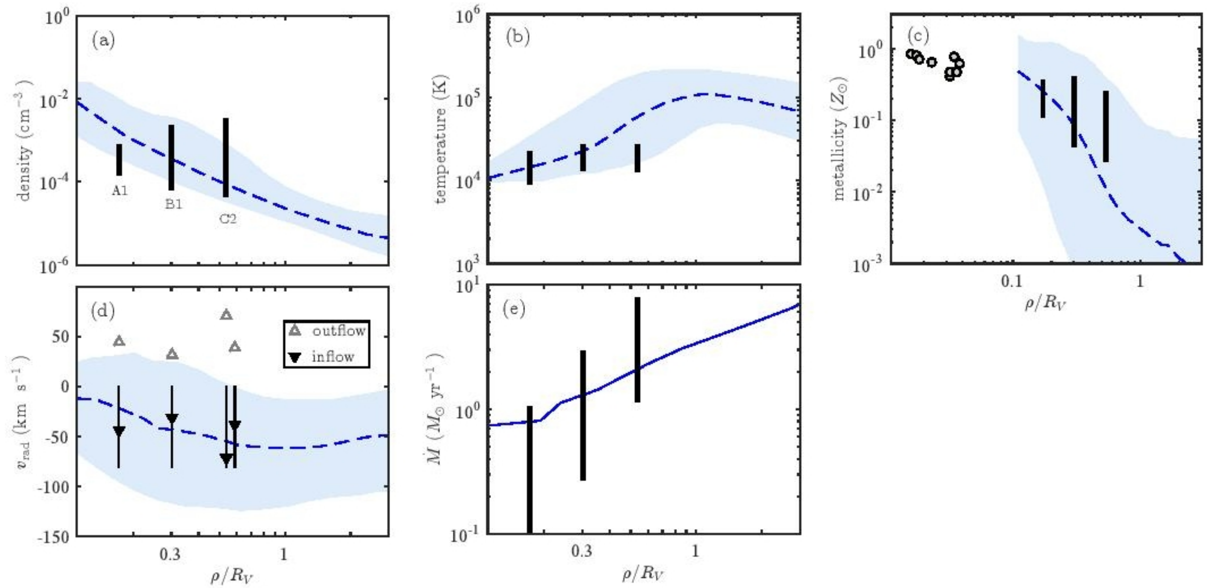


Figure 16. Comparison between the results for the absorbers towards NGC 1097 and those predicted by the simulations of cold-mode gas accretion at $z = 0$ made by van de Voort & Schaye (2012). The dashed blue lines mark the median of the property from their simulations, while the blue shaded regions mark

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THE RED AND FEATURELESS OUTER DISKS OF NEARBY SPIRAL GALAXIES

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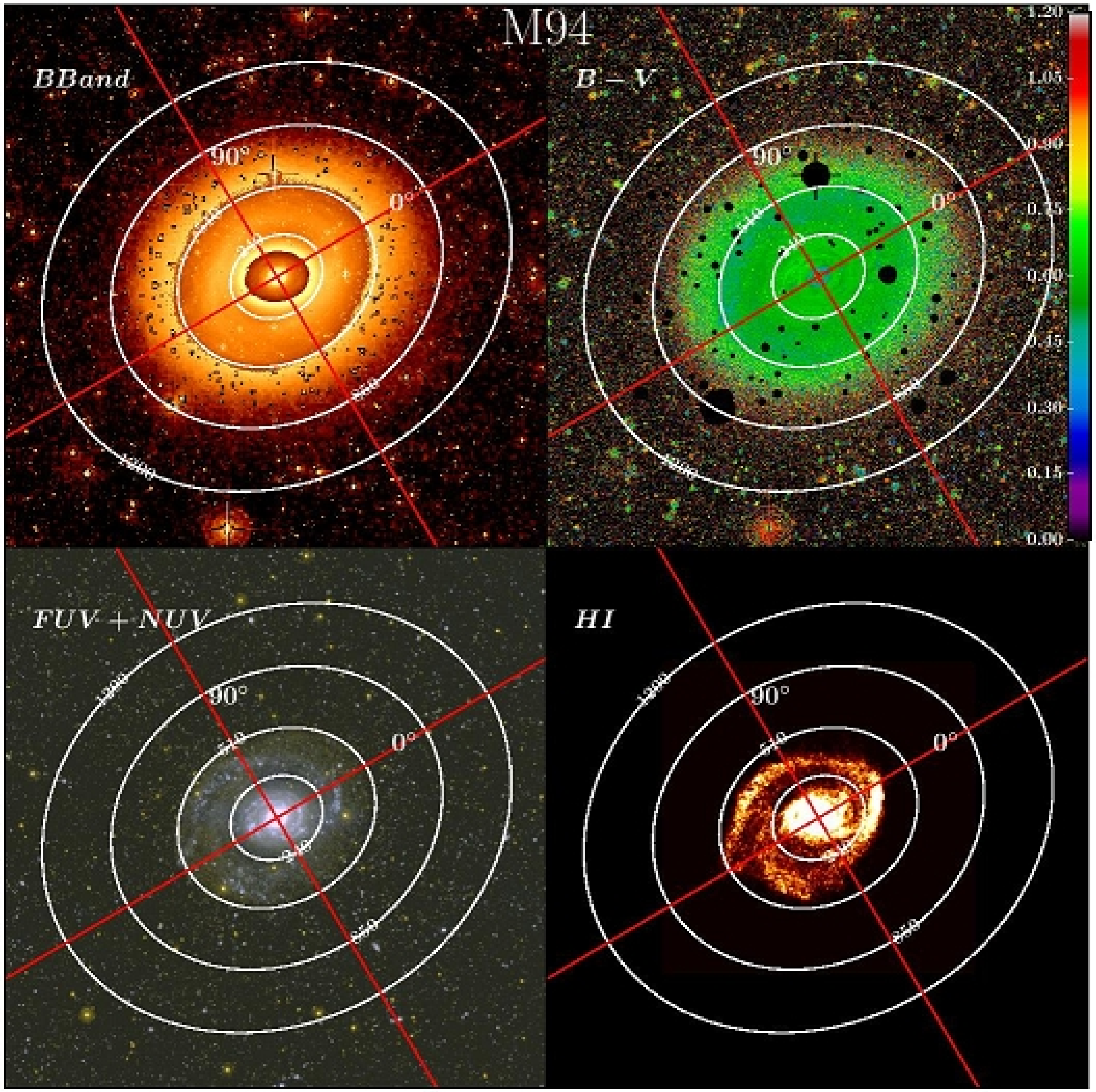
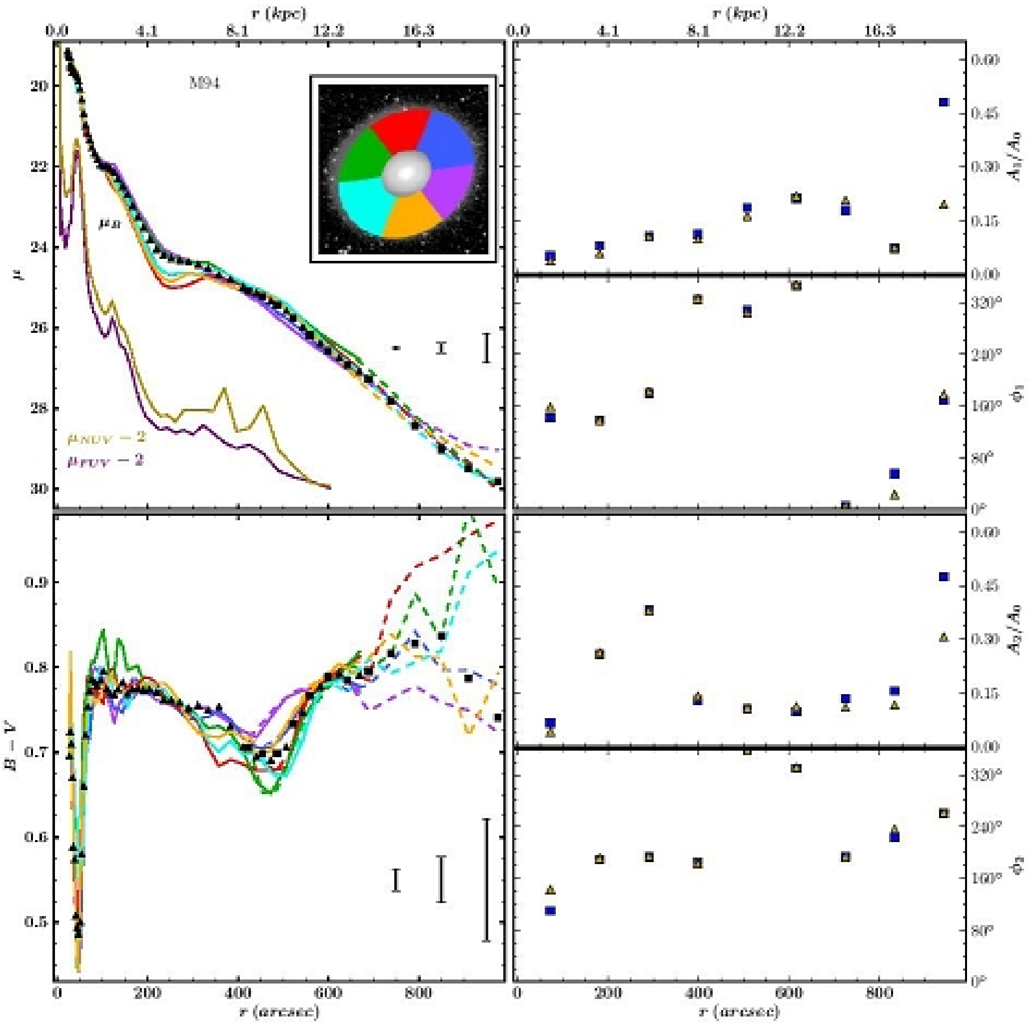
ABSTRACT

We present results from deep, wide-field surface photometry of three nearby (D=4–7 Mpc) spiral galaxies: M94 (NGC 4736), M64 (NGC 4826), and M106 (NGC 4258). Our imaging reaches limiting surface brightnesses of $\mu_B \sim 28 - 30$ mag arcsec^{-2} and probes colors down to $\mu_B \sim 27.5$ mag arcsec^{-2}. We compare our broadband optical data to available ultraviolet and high column-density H I data to better constrain the star forming history and stellar populations of the outermost parts of each galaxy's disk. Each galaxy has a well-defined radius beyond which little star formation occurs and the disk light appears both azimuthally smooth and red in color, suggestive of old, well-mixed stellar populations. Given the lack of ongoing star formation


M94
BBand
B − V
FUV + NUV
HI
90°
0°

NGC 4736



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Testing Feedback-Modified Dark Matter Haloes with Galaxy Rotation Curves: Estimation of Halo Parameters and Consistency with ΛCDM Scaling Relations

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20 May 2016

ABSTRACT

Cosmological N-body simulations predict dark matter (DM) haloes with steep central cusps (e.g. NFW), which contradicts observations of gas kinematics in low mass galaxies that imply the existence of shallow DM cores. Baryonic processes such as adiabatic contraction and gas outflows can, in principle, alter the initial DM density profile, yet their relative contributions to the halo transformation remain uncertain. Recent high resolution, cosmological hydrodynamic simulations (Di Cintio et al. 2014,

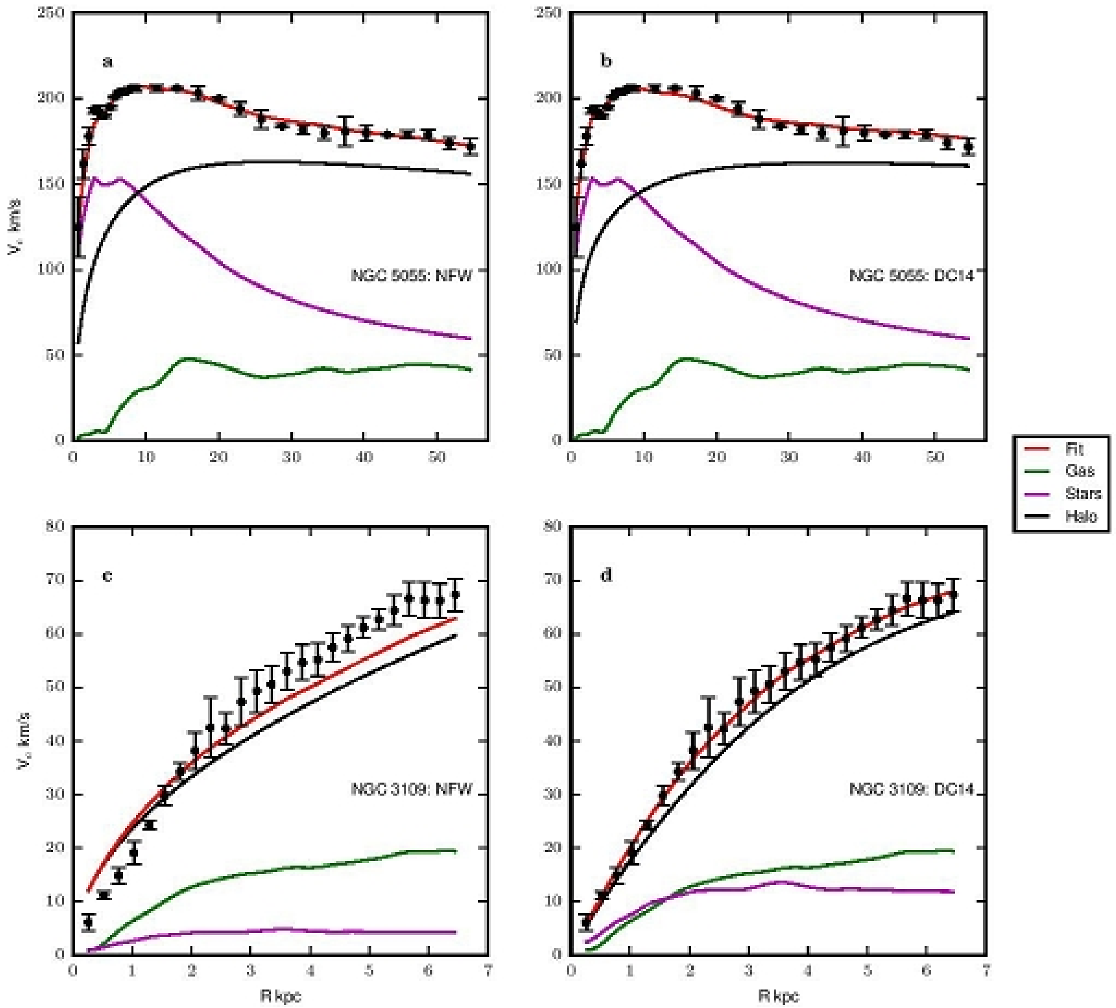
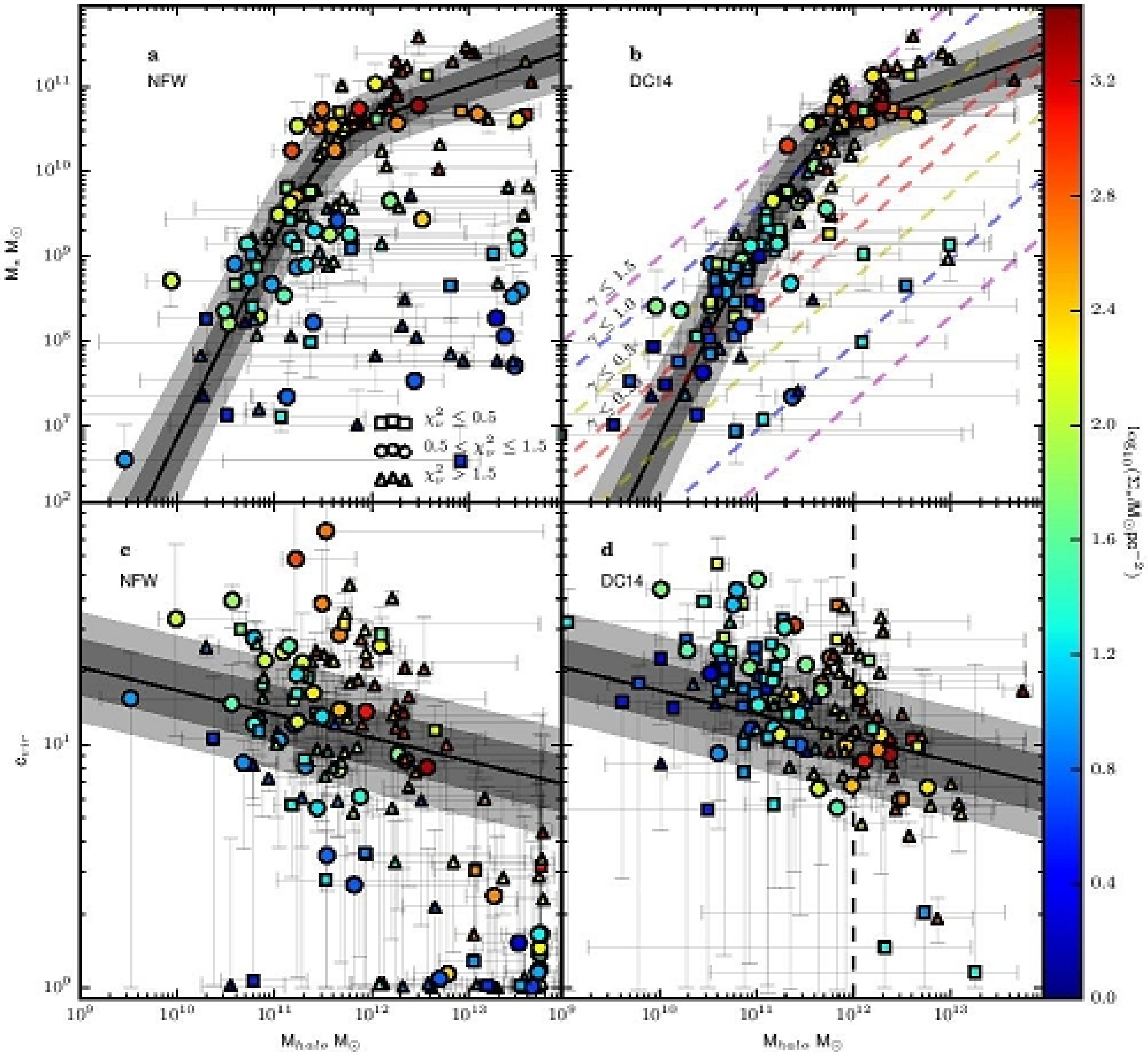


Figure 1. Fits for NFW haloes (**a**,**c**) and DC14 haloes (**b**,**d**) for a high (**a**,**b**) and low (**c**,**d**) mass galaxy. The NFW and DC14 haloes differ little for high mass and high surface brightness galaxies, giving comparable fits. At low mass and low surface brightness, the NFW fit provides a poor description of the data. This example illustrates the generic failure of cuspy halo models fit to data for low surface brightness galaxies(de Blok et al. 2001; Kuzio de Naray et al. 2009). The baryon-modified DC14 halo provides a much better fit.



igure 3. Maximum posterior NFW (**a**,**c**) and DC14 (**b**,**d**) halo fits compared to the abundance matching (Moster et al. 2013)(**a**,**b**) nd mass-concentration relations(Dutton & Macciò 2014) (**c**,**d**). Note that halo mass in the top row represents M_{200} while halo mass in he bottom row represents M_{vir}. The black lines represent the mean relation while the dark and light gray shaded regions show the $1-$ nd $2-\sigma$ scatter respectively. The points are coloured by $\log_{10}(\Sigma_*/M_\odot pc^{-2})$ where Σ_* is the central surface brightness of the stars in he galaxy. The dashed lines in panel **b** depict lines of constant inner slope for the DC14 model for galaxies of average concentration. The vertical line panel **d** shows where the DC14 model is extrapolated outside the range of halo masses used to predict it. Error bars epresent the projected 1-σ confidence interval of the posterior probability distribution.