

THICK DISK PROPERTIES FROM ULTRA-DEEP STRIPE82 IMAGING

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1. ABSTRACT

WE PRESENT THE CHARACTERIZATION OF THICK DISKS IN TWO DIFFERENT EDGE-ON GALAXIES FROM THE IAC STRIPE82 LEGACY PROJECT (FLIRI & TRUJILLO 2016). THE IAC TEAM HAS DEVELOPED A TECHNIQUE TO REACH A SURFACE BRIGHTNESS LIMIT OF **28.5-29 MAG/ARCSEC²** WITH COMBINED *g*, *r*, *i* IMAGES. HERE, A STUDY OF THE RADIAL AND VERTICAL SURFACE BRIGHTNESS PROFILES IS PRESENTED, COMPARING OUR DATA WITH MODELS. WE FIND THAT EFFECTS DUE TO THE POINT SPREAD FUNCTION (PSF) ARE IMPORTANT, BUT CAN BE ACCOUNTED FOR BY CAREFUL MODELLING. THIS SHOWS THAT **THE GALAXY OUTSKIRTS ARE STRONGLY AFFECTED BY FAINT WINGS OF THE PSF**, WHICH IS A VERY IMPORTANT ISSUE WHEN DEALING WITH ULTRA-DEEP DATA.

2. MOTIVATION

THICK DISKS CAN GIVE INVALUABLE INFORMATION ON THE FORMATION AND EARLY EVOLUTION HISTORY OF GALAXIES. OUR GOAL IS TO USE MULTI-BAND IMAGING TO STUDY THEIR COLOURS AND STRUCTURES IN UNPRECEDENTED DETAIL.

3. METHOD

3.1 CAREFUL BACKGROUND ANALYSIS

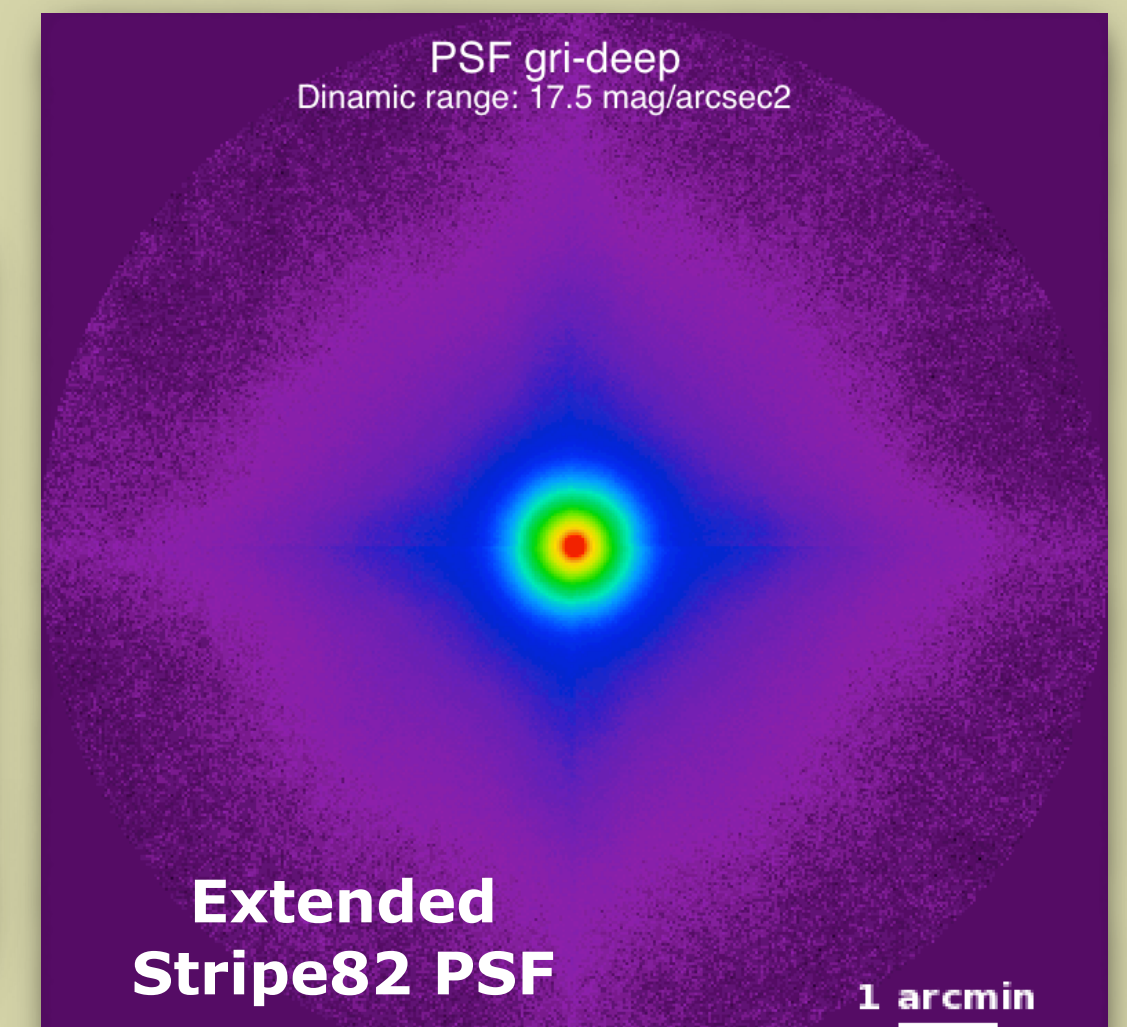
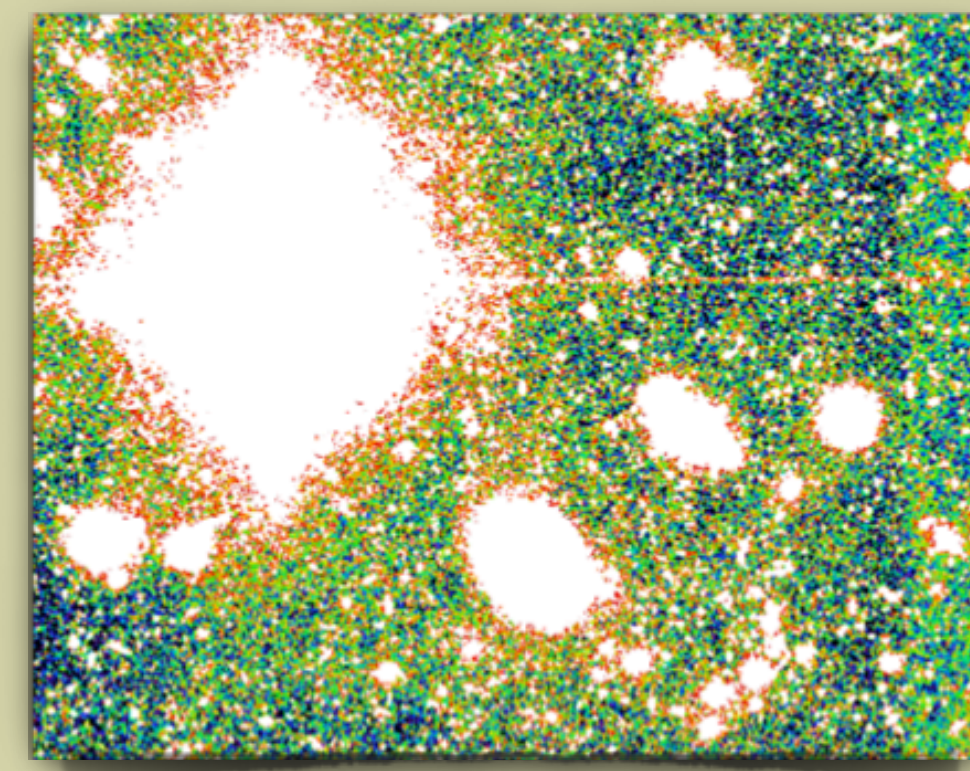
3.2 EXTENDED PSF: GALAXY OUTSKIRTS STRONGLY AFFECTED

3.3 GENEROUS MASKS (PETERS ET AL. 2016)

3.4 2D FITTING (IMFIT; ERWIN 2015): GALAXY + COMPONENTS

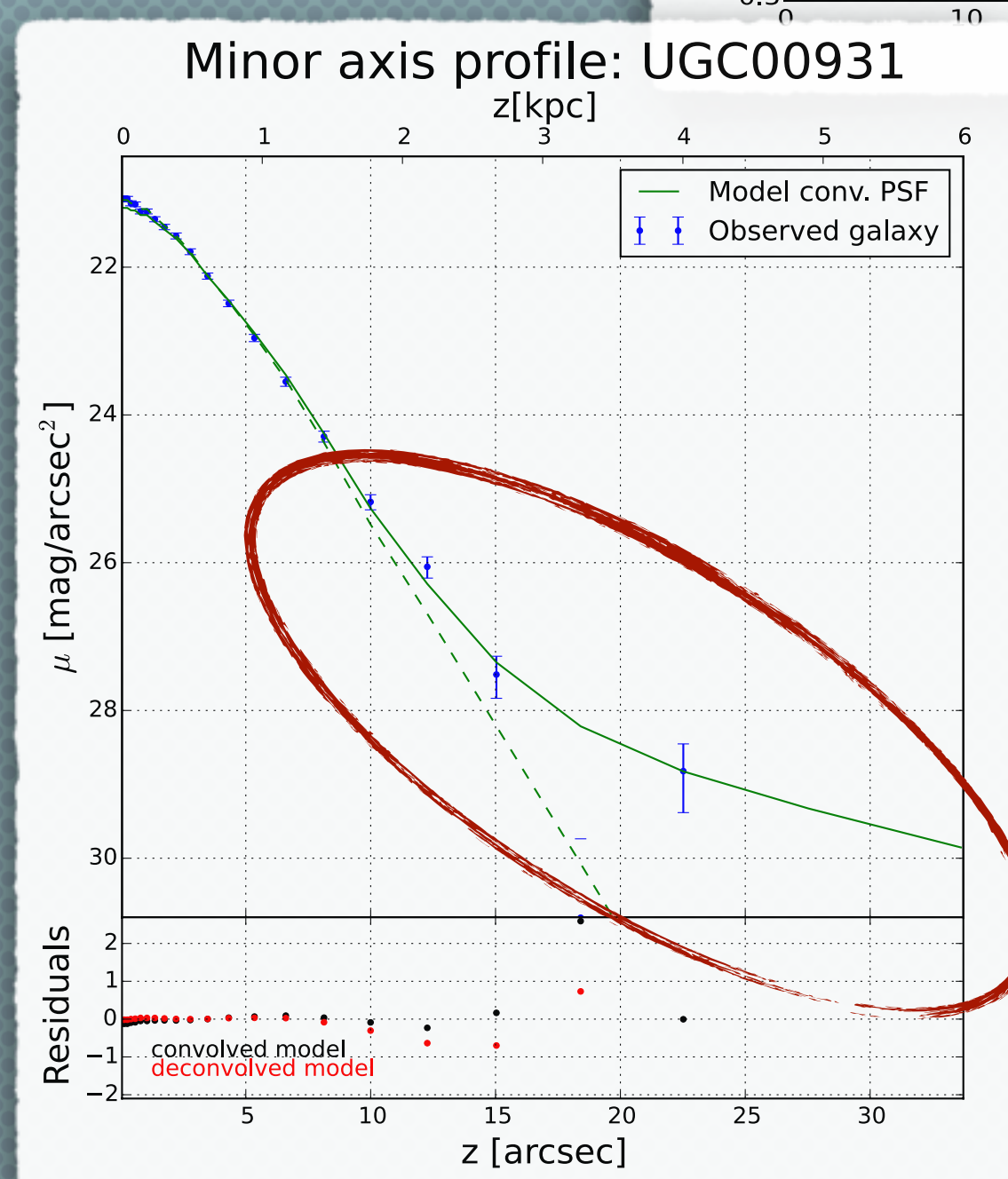
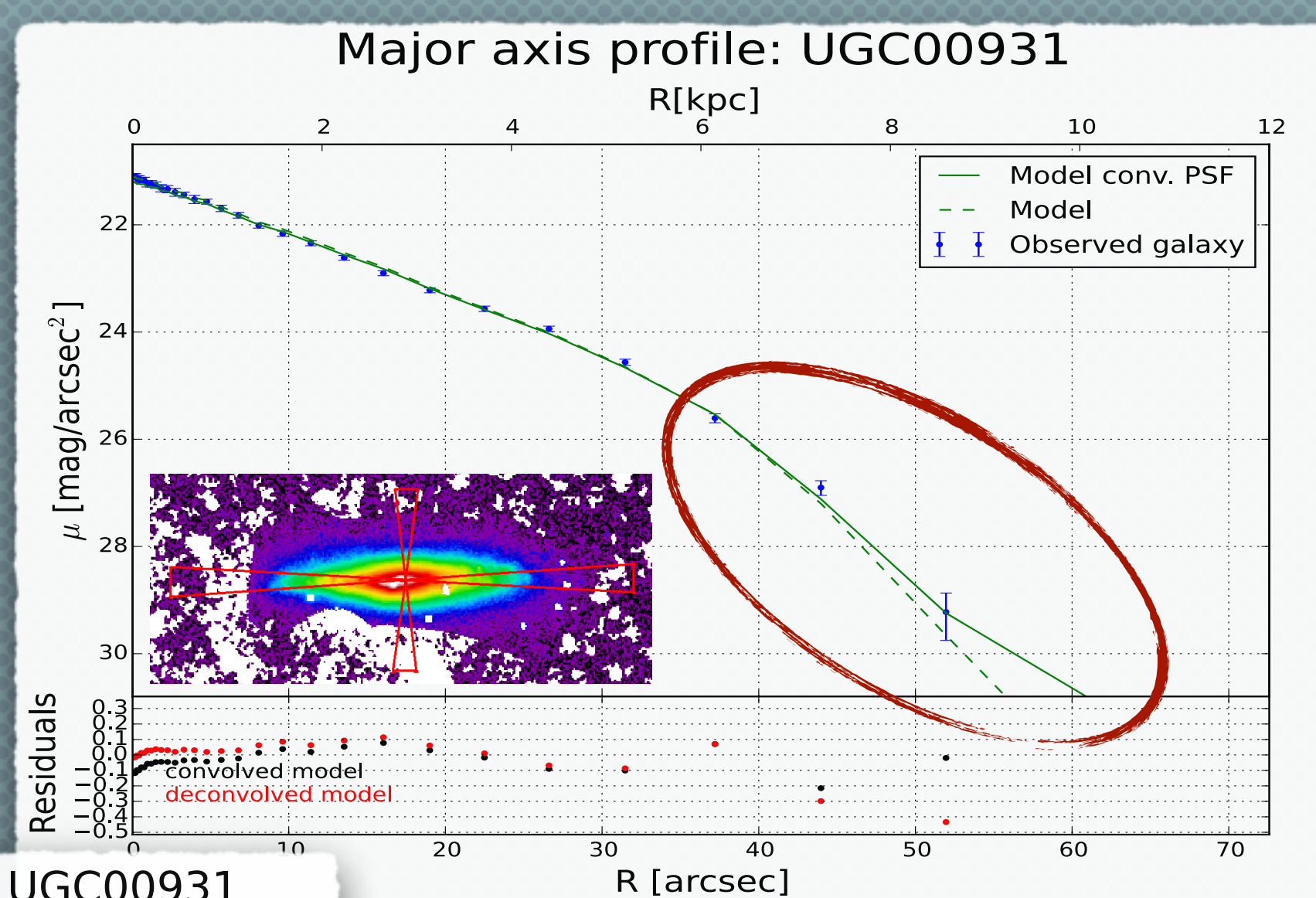
PSF-CONVOLVED MODEL
DECONVOLVED MODEL

FAINT WINGS OF THE PSF



4. RESULTS Radial & Vertical Surface Brightness Profiles

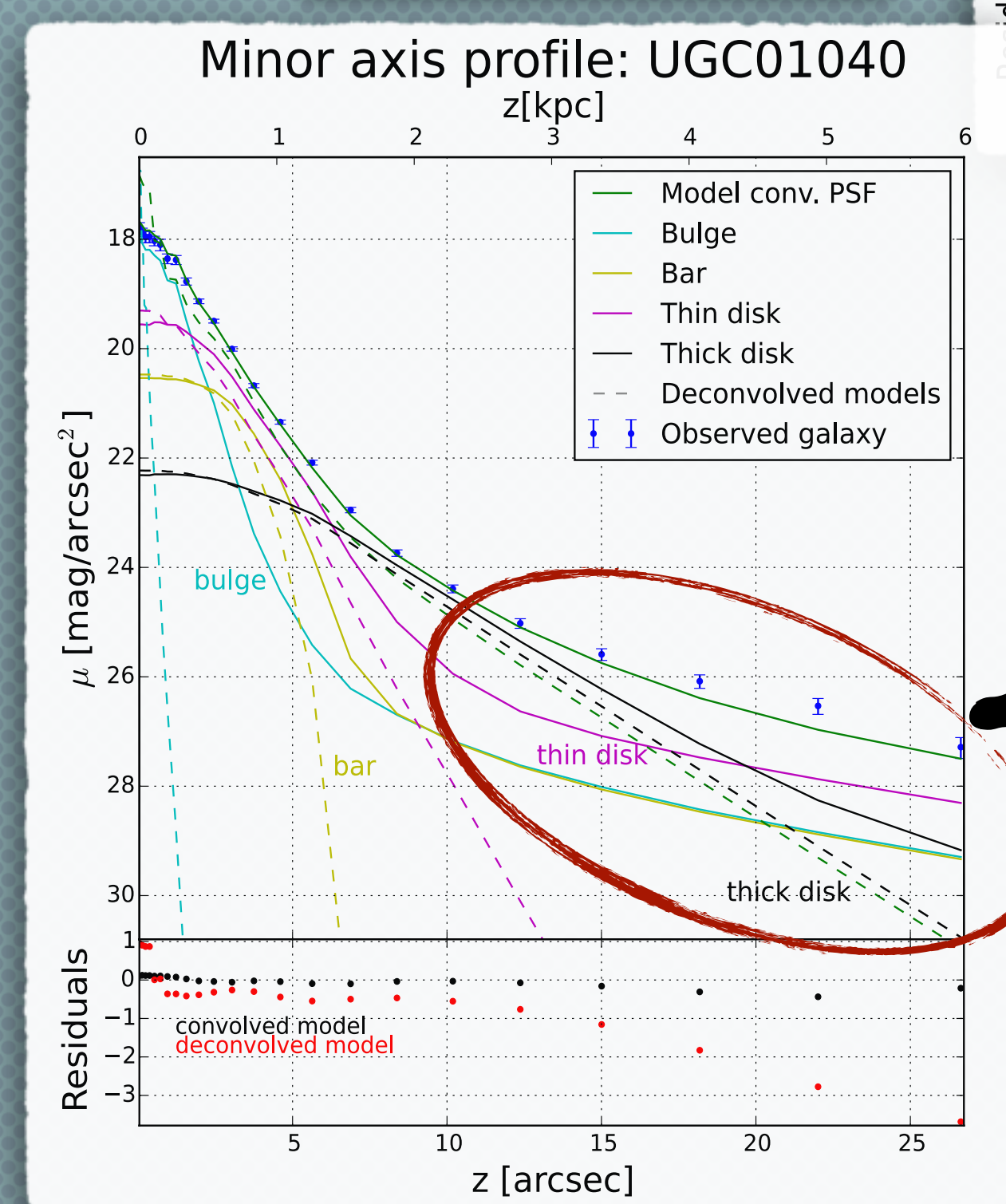
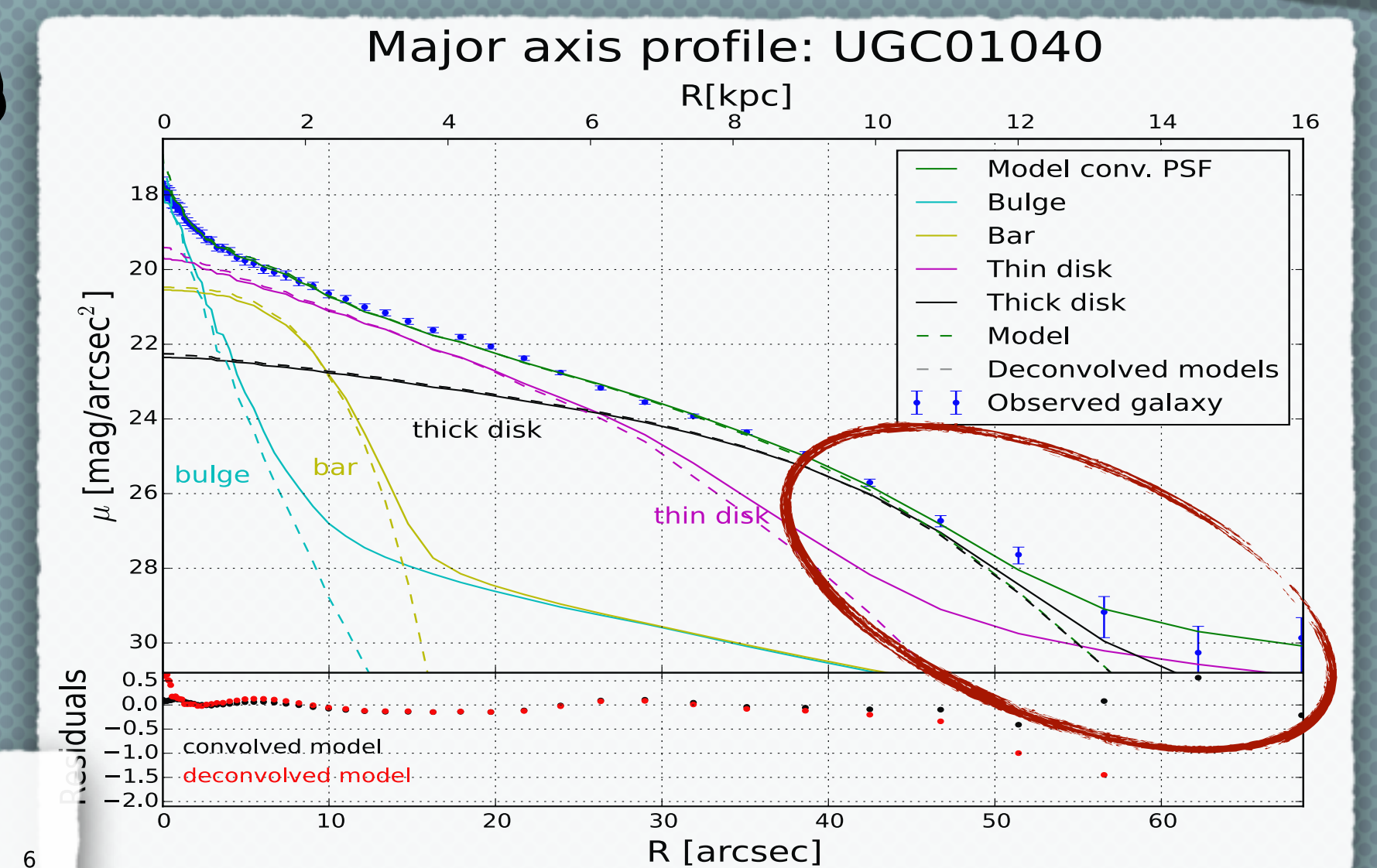
SIMPLE & LOW-MASS GALAXY:
UGC00931



* PSF effect needed to reproduce the profile

* 1-exponential fit, no thick disk needed

COMPLEX & INTERMEDIATE-MASS
GALAXY: UGC01040



THICK DISK IS SEVERELY
OVERESTIMATED WHEN IGNORING PSF

SCALE HEIGHT RATIO:
 $Z_{0\text{OBS}}/Z_{0\text{DECONV}} \sim 2.2$

* Thin disk dominates far out

* PSF strongly affects bulge and thin disk components

5. CONCLUSIONS

- * THICK DISK COMPONENT IS REQUIRED TO REACH SATISFACTORY FIT RESULTS IN COMPLEX GALAXIES
- * LIGHT FROM THE THIN DISK, REDISTRIBUTED BY THE PSF, IS DOMINANT IN THE OUTSKIRTS
- * IMPORTANT PSF EFFECT WHEN REACHING LOWER SURFACE BRIGHTNESS, ESPECIALLY IN THE VERTICAL SB PROFILES
- * THICK DISK IS SEVERELY OVERESTIMATED, BY A FACTOR OF ~ 2.2 , IF PSF IS IGNORED

6. REFERENCES

- * Erwin, 2015, AJ, 799, 226
- * Fliri & Trujillo, 2016, MNRAS, 456, 1359
- * Peters et al, 2016, in prep

<http://www.iac.es/proyecto/stripe82/>



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