SEARCHING FOR ULTRA-DIFFUSE GALAXIES IN THE LOW-DENSITY ENVIRONMENT AROUND NGC 3115

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1. INTRODUCTION

Ultra-diffuse Galaxies (UDGs) are extremely low luminosity galaxies *and some of them seem to have a lack of dark matter. Since most of the known UDGs have been found in very dense environments we know more about their proprieties than about the ones in less dense environments UDGs. Therefore, understand and determine the proprieties of these galaxies can offer important clues about galaxy formation and evolution.*
Some previous works show that field UDGs share some properties with the ones found in groups (Jiang et al., 2018), namely that the field galaxies seem to form through secular mechanisms and others works indicate that UDGs in the field are predominantly blue and star-forming (Prole et al., 2019). In this work, we will present the structural parameters of UDGs identified through visual inspection around the low-density environment of NGC 3115, the closest S0 galaxy from Milky-Way. These parameters will be used to trace their properties in future work.

2. METHOD

- Structural parameters of UDG candidates were measured using images obtained with the Dark Energy Camera at the Blanco Telescope;
- The images were inspected visually using the Ultra-Diffuse Object Candidates Search Tool developed by W. Schoennel;
- The tool generates in total four images:
  - a fits file of the stamp for each band;
  - an image of linear render with scales as the background with a Gaussian kernel applied;
  - two images that have SEXtractor detections masked out;
  - the fourth image with the colour combination of g-r filter.
- SEXtractor was used to mask the others objects in the field;
- Following this, the absolute magnitude of the candidates as well as the effective radius were measured;
- To measure the structural parameters we used IMFIT to fit a combined model of an exponential and a Sérsic models and using a uniform background sky (figure 01).

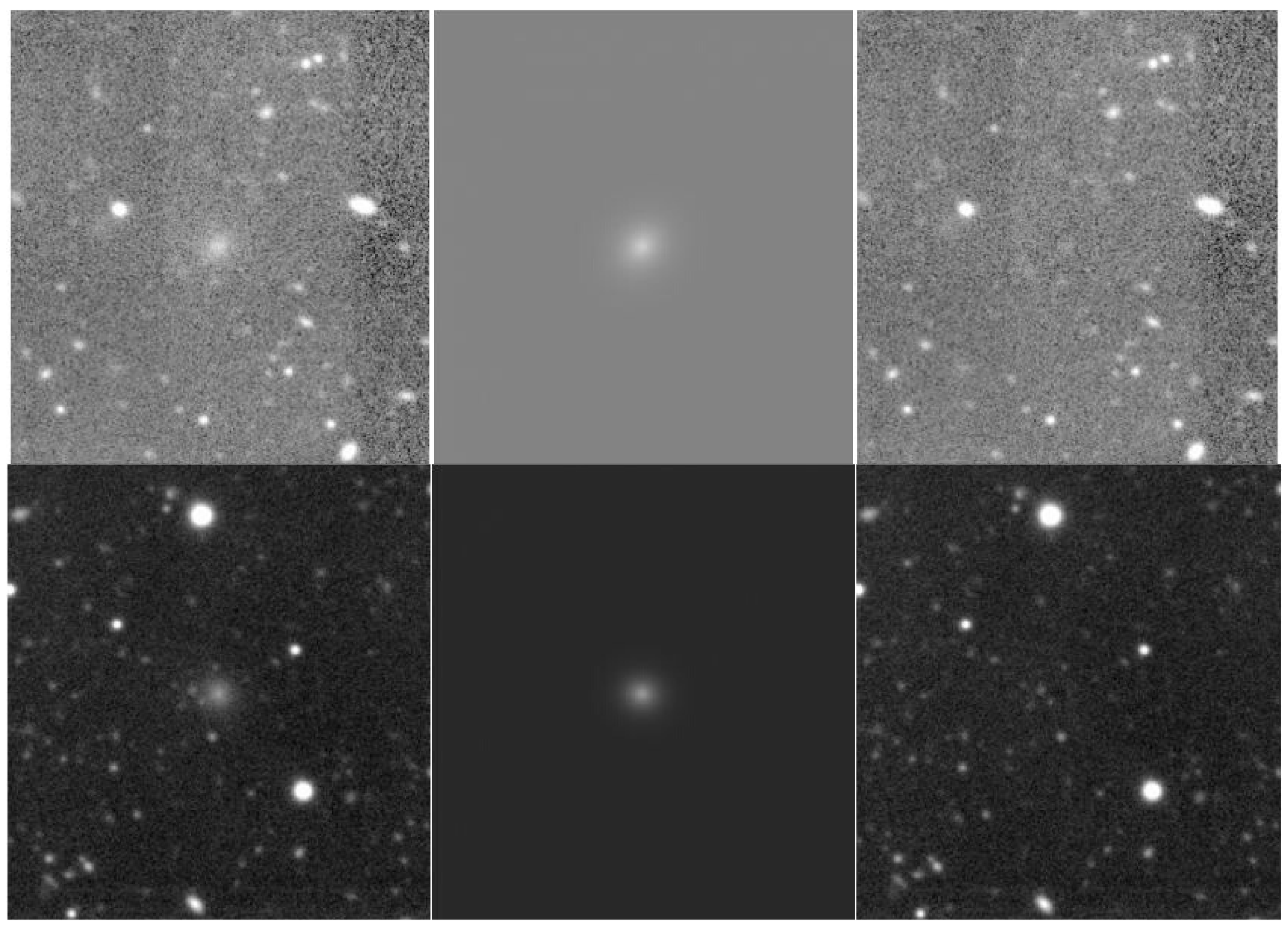

Figure 1. Example of models obtained using IMFIT. (the original stamp on the left panel, the model in the middle panel and the residual on the right panel.)

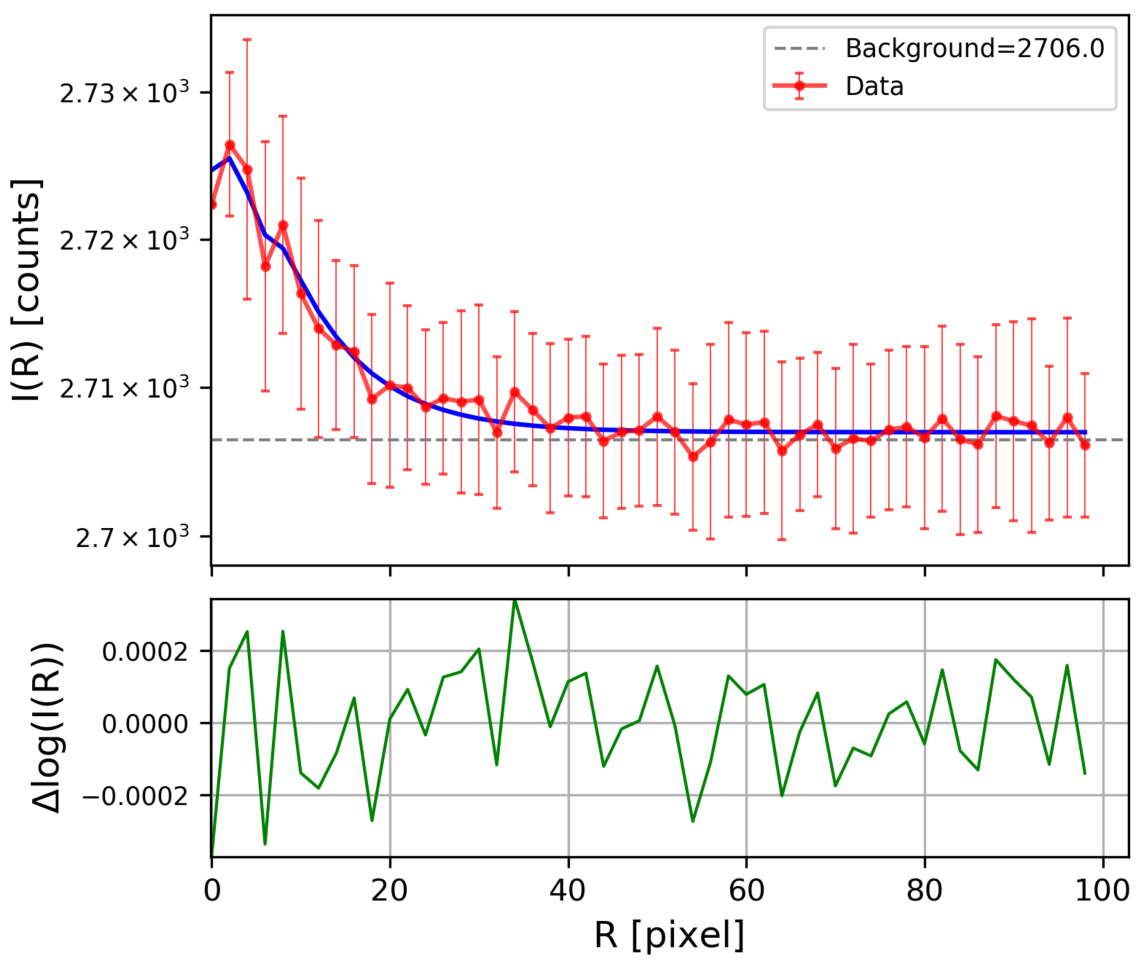

Figure 2. Example of intensity profile distribution and a radial profile of the model and from the UDG candidate data (Blue line from the model).

REFERENCES

- Jiang, F. et al. M.N.R.A.S, Vol. 487, Issue 4, 2019;
- Prole, D. J. et al, M.N.R.A.S, Vol. 488, Issue 2, 2019;
- Eigenthaler, Paul et al. T.A.J, Vol. 855, Issue 2.

3. RESULTS & DISCUSSIONS

To determine which of the candidates were more likely to be an UDG, we compare: the absolute g band magnitude and their effective radius to the ones of the UDGs presented in Eigenthaler et al (see Fig 3). Based on this, we found ~9 UDG plausible candidates.

In the future, we will use the structural parameters obtained in this work to select the best candidates for follow-up campaigns to confirm their UDG nature and characterize their properties.

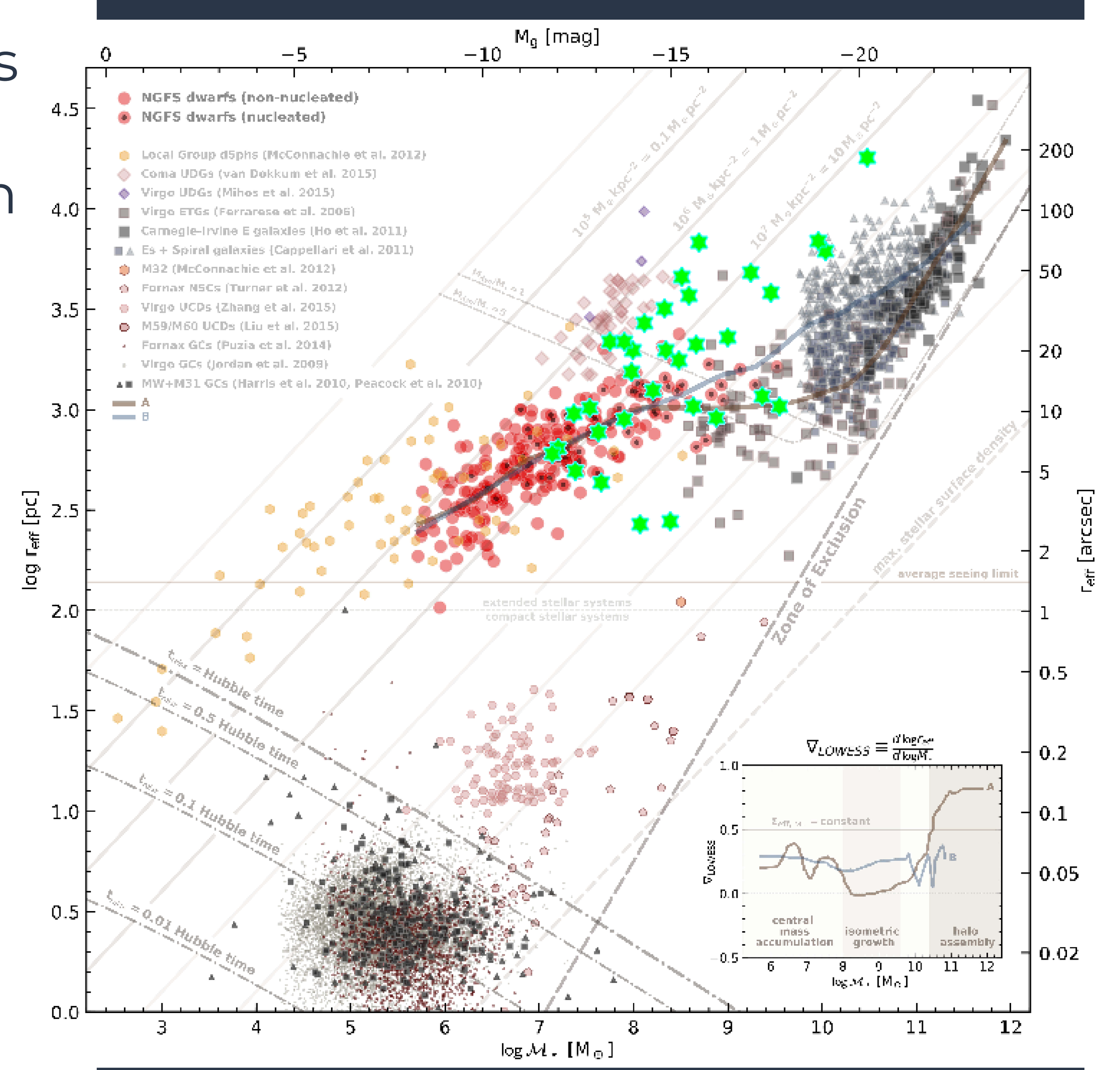

Figure 3. Plot of the absolute magnitude in the G band versus effective radius of Eigenthaler et al. 2018, where the UDGs occupy a central region, the graph has an overlap with the candidates from our sample.

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