

Characterizing galaxy-dark matter offsets in galaxy clusters of the Illustris simulation

Karen Y. Ng,¹ Annalisa P. Pillepich,² William A. Dawson,³ D. Wittman,¹
Lars Hernquist,² etc. [order TBD]

arXiv

ABSTRACT

Key words: – methods: statistical

1 INTRODUCTION

2 DATA

2.1 Test data from Gaussian mixture(s)

2.2 Data from the Illustris simulation

2.2.1 *Characterizing the non-relaxedness of the galaxy clusters / groups*

2.3 Data preprocessing / selection

3 METHODS

3.1 Galaxy Centers

3.1.1 *Cross-validated Kernel Density Estimation (KDE) and peak finder*

3.1.2 *Shrinking aperture*

3.1.3 *Weighted and unweighted centroids*

3.1.4 *Brightest Cluster Galaxies (BCG)*

3.2 DM Centers

3.3 Finding offsets

4 RESULTS

4.1 Benchmark test results from Gaussian mixtures

4.2 Galaxy-DM Offset in Illustris

5 DISCUSSION

5.1 Comparison to other simulations

5.2 Comparison to other observational studies

5.3 Galaxy-DM Offset in Merging Galaxy Clusters

6 ACKNOWLEDGEMENTS

APPENDIX A: KDE

This paper has been typeset from a \LaTeX file prepared by the author.