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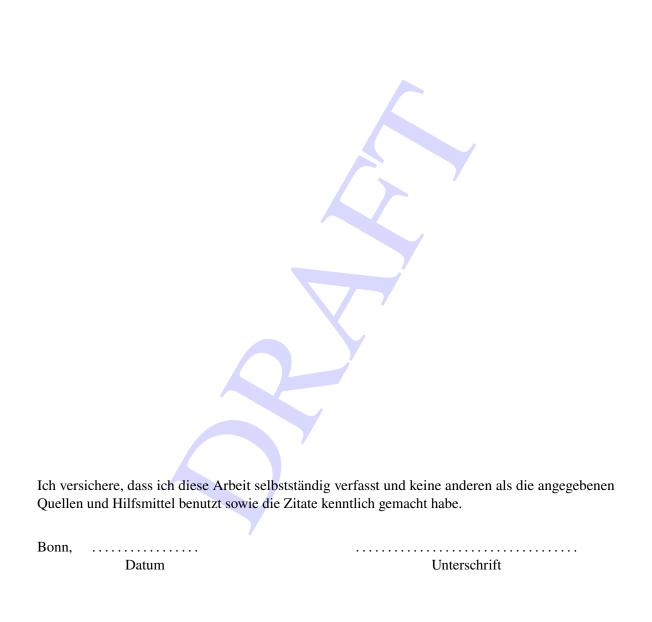
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You should probably use \chapter* for acknowledgements at the beginning of a thesis and \chapter for the end.

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CHAPTER 1

Introduction

Testing Kolokythas et al., 2020. fff

Theoretical Background

2.1 Clusters and groups of galaxies

Throughout the Universe galaxies are not homogeneously distributed, but rather are aggregated in massive cosmic structures called galaxy groups or galaxy clusters. Galaxy cluster feature masses typically surpassing $M \gtrsim 3 \times 10^{14} \, M_\odot$, while galaxy groups lie closer to $M \sim 3 \times 10^{13} \, M_\odot$ (Schneider, 2006). Advancements in X-ray astronomy have revealed that these structures serve as significant emitters of X-ray radiation (Cavaliere, Gurksy, and Tucker, 1971). It is currently well understood that this emission stems from a hot intergalactic gas known as the intracluster medium (ICM), characterized by temperatures approximately in the 10^7 to 10^8 K range. Moreover, it is widely accepted that the ICM is the primary baryonic component of a galaxy cluster, enabling the study of a variety of cosmological (Kaiser, 1986) and astrophysical processes (Lovisari and Reiprich, 2018). In particular, X-Ray analysis lead to a deeper understanding of dynamical disturbances, such as mergers, which strongly change the morphology of the ICM. (Bykov et al., 2015)

2.1.1 Emission Processes

CHAPTER 3

Data Reduction

Bibliography

- Bykov, A. M. et al. (2015), Structures and Components in Galaxy Clusters: Observations and Models, Space Science Reviews 188 141, ISSN: 1572-9672, URL: https://doi.org/10.1007/s11214-014-0129-4 (cit. on p. 2).
- Cavaliere, A. G., H. Gurksy, and W. H. Tucker (1971), Extragalactic X-ray Sources and Associations of Galaxies, Nature 231 437, ISSN: 1476-4687, URL: https://doi.org/10.1038/231437a0 (cit. on p. 2).
- Kaiser, N. (1986), Evolution and clustering of rich clusters, Monthly Notices of the Royal Astronomical Society 222 323, ISSN: 0035-8711, eprint: https://academic.oup.com/mnras/articlepdf/222/2/323/18522062/mnras222-0323.pdf, URL: https://doi.org/10.1093/ mnras/222.2.323 (cit. on p. 2).
- Kolokythas, K. et al. (2020), Evidence of AGN feedback and sloshing in the X-ray luminous NGC 1550 galaxy group, Monthly Notices of the Royal Astronomical Society 496 1471, ISSN: 1365-2966, URL: http://dx.doi.org/10.1093/mnras/staa1506 (cit. on p. 1).
- Lovisari, L. and T. H. Reiprich (2018), *The non-uniformity of galaxy cluster metallicity profiles*, Monthly Notices of the Royal Astronomical Society **483** 540, ISSN: 0035-8711, eprint: https://academic.oup.com/mnras/article-pdf/483/1/540/27017065/sty3130.pdf, URL: https://doi.org/10.1093/mnras/sty3130 (cit. on p. 2).
- Schneider, P. (2006), *Extragalactic Astronomy and Cosmology: An Introduction*, Second Edition, Springer-Verlag Berlin Heidelberg 2006, ISBN: 978-3-642-54082-0 (cit. on p. 2).

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