

JWST NIRCам Observations of the Globular Cluster Population in RXJ 2129.7+0005

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Introduction

- ❖ With JWST, we are now able to extend observations of globular cluster (GC) systems to great distances
- ❖ GCs trace out the gravitational field of the galaxy cluster, and therefore can be used to probe the dark matter halo [1,2]
- ❖ RXJ 2129.7+0005 (RXJ 2129) is a relaxed galaxy cluster with a redshift of 0.234 and a lookback time of 2.90 Gyr

Methods

- ❖ RXJ 2129 is imaged in three bands from the short wavelength channel of NIRCам: F115W, F150W, and F200W

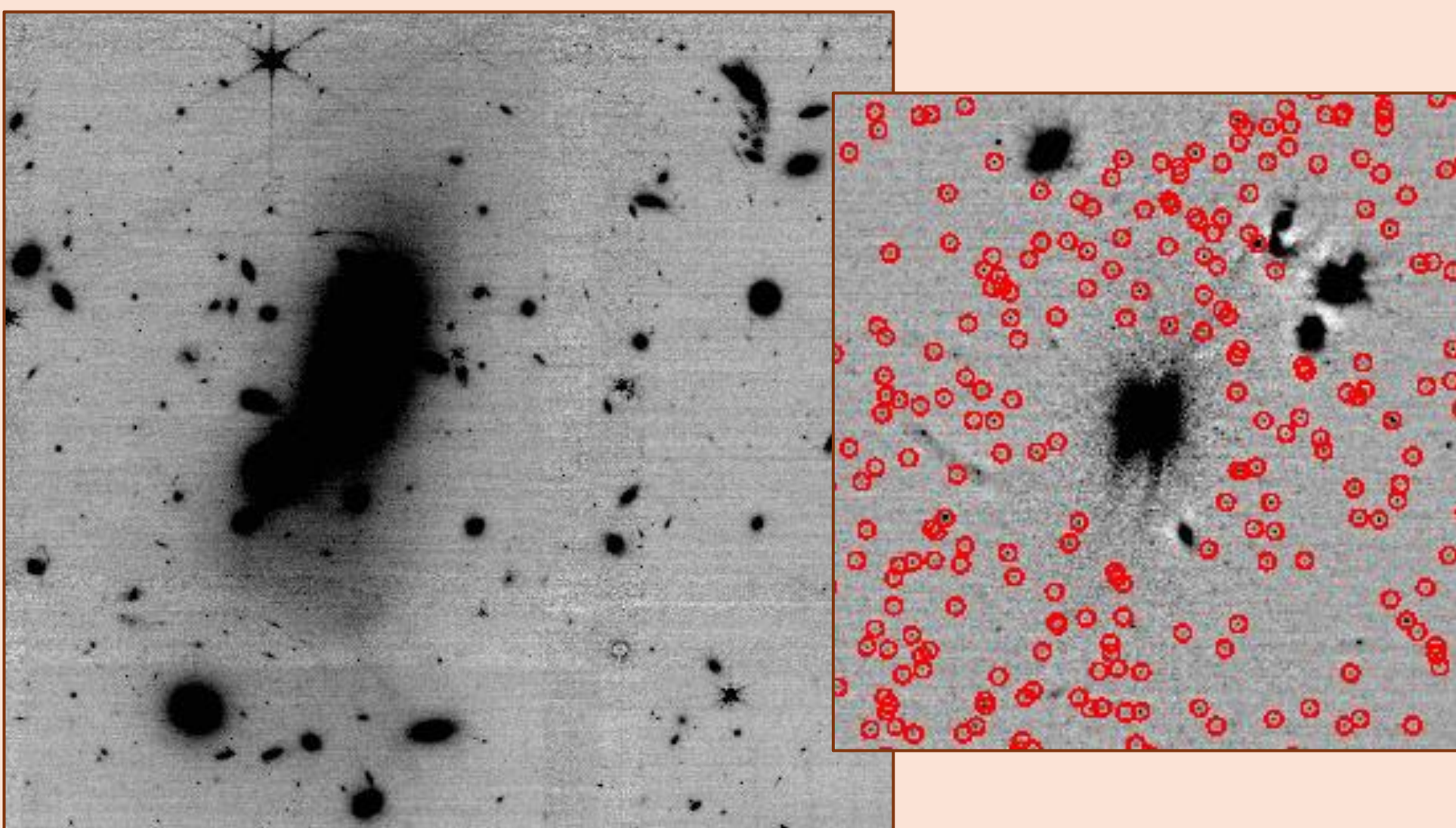


Figure 1: F200W image of RXJ 2129 (left) and detected globular clusters (circled in red) near the brightest cluster galaxy in the flattened image (right)

- ❖ Object selection and photometry was conducted using the tools within the *daophot* software (Stetson 1987)
- ❖ To test the photometric limits and completeness of our measurements, we perform artificial star tests

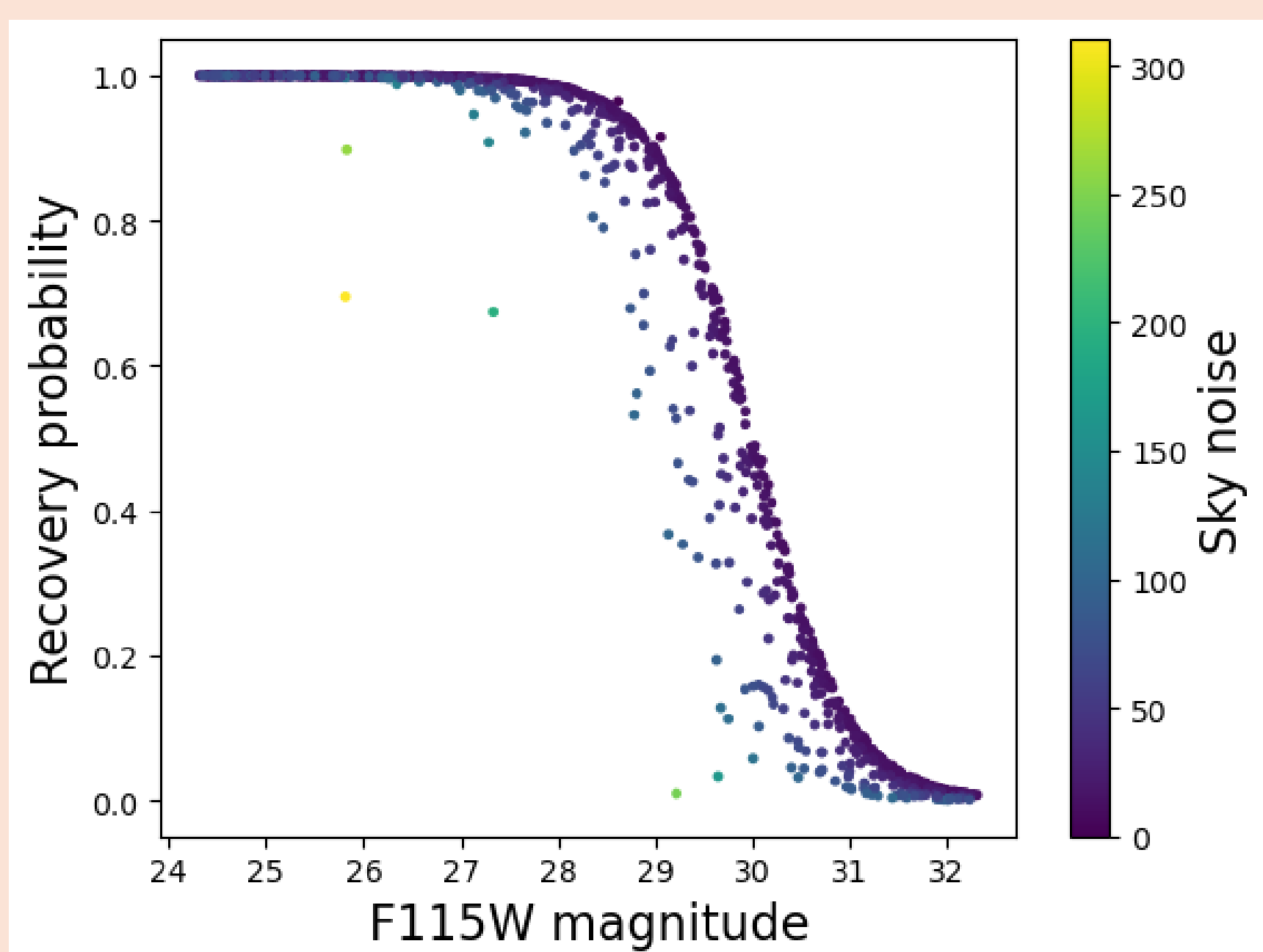


Figure 2: Recovery probability of 1060 artificial stars in the F115W filter using logistic regression fit by the magnitude and local sky noise

Results

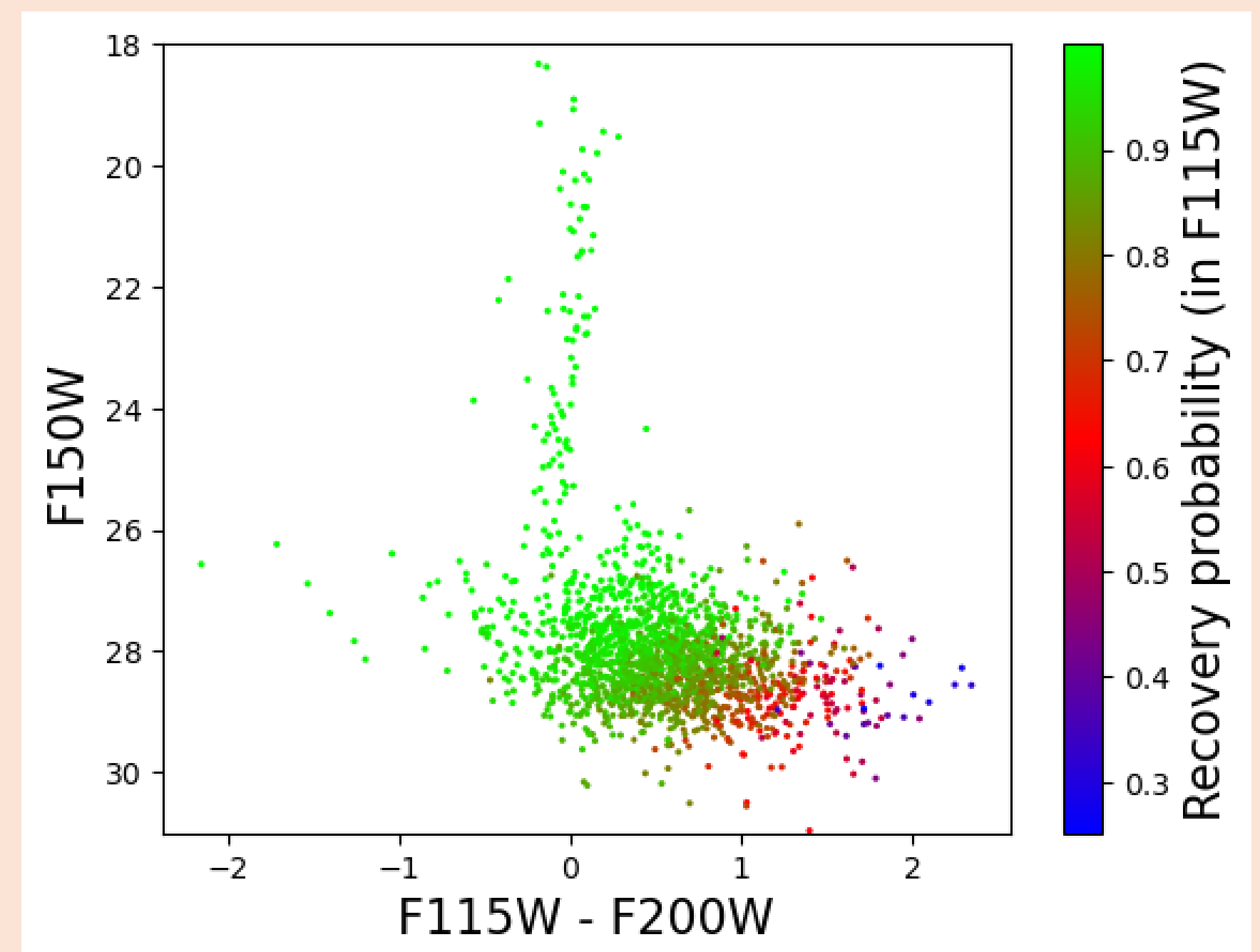


Figure 3: Colour-magnitude diagram of point sources in RXJ 2129. Magnitudes are in AB magnitudes corrected for the cosmological K correction and foreground reddening. Points are colour-coded by the recovery probability using the logistic regression fit.

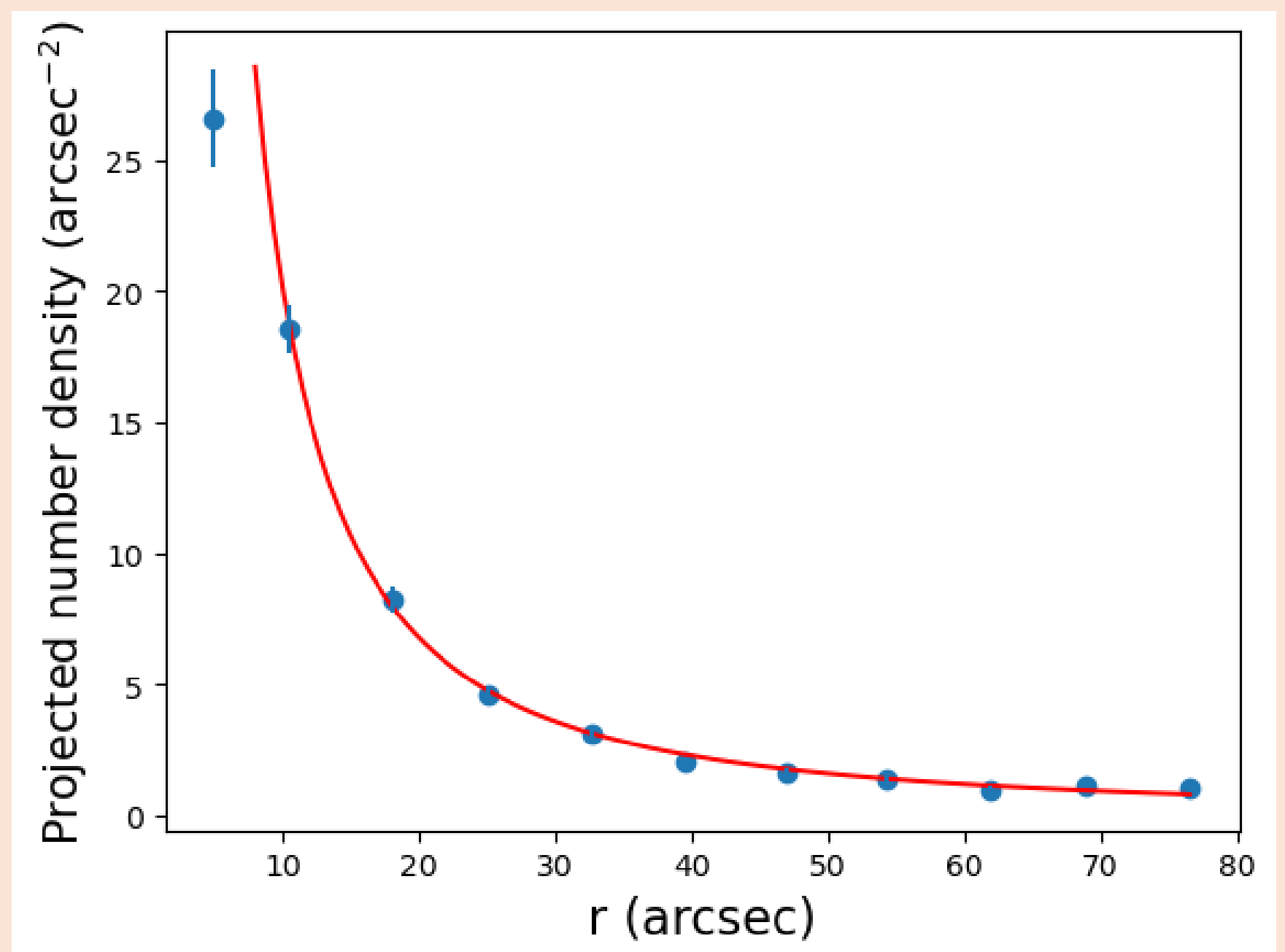


Figure 4: Radial distribution of point sources from the brightest cluster galaxy. The object count is weighted by the recovery probability of each GC, and objects with a recovery probability of less than 50% are removed.

Future Work

- ❖ Next, we will compare the spatial distribution of GCs to the gravitational lensing map of the galaxy cluster
- ❖ Additionally, we will determine metallicities of the GCs and explore the bimodality of the distribution

[1] Harris W., Reina-Campos M. 2023, MNRAS, 526(2), 2696-2708, doi: 10.1093/mnras/stad2903

[2] Reina-Campos M., et al. 2022, MNRAS, 513(3), 3925-3945, doi: 10.1093/mnras/stac1126