

School of Physics and Astronomy



Senior Honours Project Astrophysics

Deep Stacking of AGN Hypervariables

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March 29, 2020

Abstract

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Declaration

I declare that this project and report is my own work.

Signature:

Date: March 29, 2020

Supervisor: Professor A. Lawrence, FRSE, FRaS

12 Weeks

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1 Introduction

1.1 AGNs and the Viscous Accretion Disc

[lawrence'2018]

1.2 The Pan-STARRS Survey

[bruce'2017]

2 The Liverpool Telescope Data

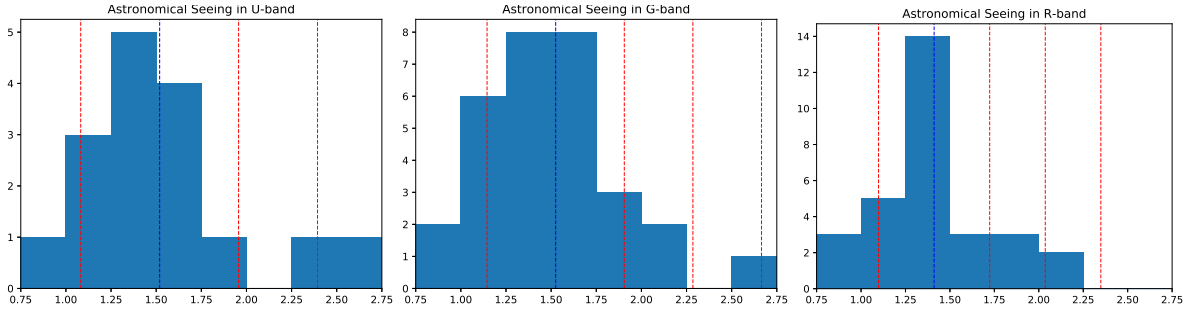


Figure 1: Astronomical seeing of the LT data in Johnson UGR bands.

2.1 S/N Ratio and Astronomical Seeing

3 Centroiding on J094511

3.1 Initial Guess: Max-Value Centroiding

3.2 Initial Guess: WCS Centroiding

[lang'2010] [greisen'2002] [calabretta'2002]

3.3 Refinement: Two Dimensional Weighted Mean

3.4 Aperture Centroiding

3.5 Challenges in the U-band

4 Cross Sections of J094511

4.1 Linear and Radial Cross Sections

4.2 Excess Luminosity in the Wings

4.3 Point Spread Function Subtraction

5 Conclusion

Appendix A: Alignment Algorithm