

Appendix A

Data Reduction

A.1 IRAF Parameters

The parameters we used in **DAOFIND** to reduce our H4RG-10-007 photometric data are chosen according to the recipe laid out in Davis [93]. In particular, for a given sky value, s (in ADU), number of photons per ADU, p , and read noise, r (in e^-), the expected 1σ variance in the sky will be

$$(\sqrt{s \times p + r^2})/p \tag{A.1}$$

For our images, with $s = 2.5$, $p = 1$, and $r = 0.3$ for the combinations of dithers, we have $1\sigma = \sqrt{2.5 \times 1 + 0.3^2} = 1.609$.

Most of the parameters were kept at default. We adjusted **fwhmpsf** according to the seeing for each night. It was typically between 11 pixels and 14 pixels (larger in g than in i and y), corresponding to the 1.375-1.75 arcsecond seeing at the site. Following Davis [93], we set **psfrad** = $4.5 \times \text{fwhmpsf}$ and **fitrad** = **fwhmpsf**. We also adjusted **sigma** according to the number of dithers used to form the final image and the gain of the preamplifiers.

The parameter to which the finding algorithm was most sensitive was **threshold**. Several “eye-ball” tests for each image were performed to determine a reasonable value for **threshold**. Fortunately, doing a few iterations of detection, psf fitting, and subtraction eliminated the need to find a perfect value for this parameter.