The effect of detector non-linearity on WFIRST PSF profiles for weak gravitational lensing measurements (Plazas et al, PASP)

This is a carefully prepared report on the accuracy with which the linearity of a near-infrared HAWAII-4RG-type detector should be calibrated in order to meet the requirements when used for weak gravitational lensing. A direct relationship is obtained between the non-linearity and the introduced size and ellipticity errors for the PSF. The report is in fact useful for any detector which has a quadratic dependence on linearity, and, further, in that it describes a methodology which can be adapted for use more widely.

The report describes the methodology in full. In some places the substantial level of detail for the creation of relatively standard image simulations (for example the use of which galsim routines, and, in some cases, the details within them) seems excessive and obscures the flow, while also being too specific, so some judicious shortening would beneficial.

The text regarding the oversampling techniques could benefit from simplification and clarification. The summary at the end of section 3 is helpful in this regard, but it isn't immediately evident (to this reader at least) from the text exactly what has been done, which in the end is fairly standard. For example, in the paragraph containing equation (3), is it meant that the PSF is initially convolved with the pixel response at the native pixel scale, then simply regridded onto a 3x finer grid? If so, it's not clear why the shape measurement routines should work an better on these images. In any case, in the paragraph after equation (3), it would help clarifying that the shape measurement is performed on each of the 100 postage stamps separately to create a distribution of sizes and ellipticities. Then in the first sentence of the 2nd paragraph after equation (4) is misleading, as it is understood that there are 100 postage stamps and only one entry per filter in Table 1. (The use of "random" in this section of text would seem to be incorrect, as the offsets are distributed over a uniform grid.) In the middle of this paragraph it is stated that the centroid is randomised, but as this is already stated in the paragraph after equation (3), it gives the impression of an additional randomisation. In step 2 of the summary in section 3.3, what is meant by the first word "Draw"?. Also, the last sentence is confusing: would it be correct to write that "The centroid of the profile will be selected from points on a uniform grid within the native pixel."? Then in step 6, it would help specifically saying that the values are the size and ellipticity components. Other improvements may be considered where helpful.

In the paragraph after equation (12), it is not clear what is meant in the sentence starting "For this error tolerance…", or how this might be useful.

Just above equation (14), while it is mentioned that requirements can be derived on the maximum tolerable dispersion, this is not explicitly calculated, unlike as done in the paragraph after equation (12). It would be interesting if this could be done.

Some particular points:
• in footnote 1, other references might include Miller et al (2013) (DOI:10.1093/mnras/sts454) and Alsing et al (2016) (DOI: 10.1093/mnras/stv2501)
• in paragraph 3 of section 1, the extensive study of systematic errors from CCDs extends beyond those for thick high resistivity devices. References might include Prod'homme et al (2014) (DOI: 10.1117/12.2054862) and Niemi et al (2015) (DOI: 10.1007/s10686-015-9440-7);
• in paragraph 2 of section 3.1, the 30% value for the central obscuration should be specified as a linear value;
• a reference should be given for equation (1).

Editorially, the text is well written. In case this might be useful:
• in the 1st paragraph of section 1, "allow to test" might be better "allows the testing of";
• in the 3rd paragraph of section 2, "by" should be added after "band gap";
• just below equation (2), "plug in" would be better as "substitute";
• in the 3rd paragraph of section 3.1, "impact NL" should contain "of";
• in the paragraph above equation (4), the first sentence might end better as "…which depend individually on each pixel."".