

Astronomy 4100, Homework # 13, 18 February 2015 (due 25 February 2015).

1. You are observing a star with a 1D pixel array of 15 pixels. The readout is in some arbitrary units proportional to the photon flux hitting the pixels in a wavelength range that is the same for all of your measurements plus some unknown offset.

You first take a dark, and get:

17.6	18.0	16.9	19.0	17.0	22.6	16.8	18.2	16.2	19.5	14.6	18.5	19.8	21.4	18.9
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Then you take a flat of an illuminated white card and get:

109	113	146	116	110	147	113	118	138	118	103	111	113	115	112
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Then you take a shot of a dark part of the sky and get:

39.8	37.7	40.4	38.3	39.8	43.7	35.8	43.5	39.0	40.5	42.4	39.6	41.0	44.4	40.0
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Finally you take a shot of the star and get:

37.6	45.5	38.7	44.0	39.0	46.6	87.8	89.1	43.6	40.6	46.4	46.0	42.7	49.1	42.6
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Find the position of the star in pixel units with the first being 1.0 and the last being 15.0, and estimate the sky background in the arbitrary pixel readout units.

You can do it by hand, but using a spreadsheet or something similar will make it much easier. Explain the assumptions you are making. Mention if you would like to take more data to justify your assumptions and describe what more data you would like to take. Describe the steps you took to get your answers and making some plots to illustrate the steps would be good, but not necessary. Note that measurements are not complete unless they have some estimate of the uncertainty on them.