

Weekly Report

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1 Color dependency of measurements

The finding that the measurements for magnitude on the logarithmic scale do not exactly correspond to the visual magnitudes of stars recorded in the Bright Star Catalog lead to the realization that the values are not exactly comparable - stars' visual magnitudes are measured as filtered through a 551 nm filter, while the imagers capture over a wider range of wavelengths.

It may be possible to find a magnitude value comparable to measurements by using the color indices recorded in the Catalog. The UBVRI photometric system commonly used in stellar photometry provides a star's magnitude measured through a set of five narrow bands, from which a reasonable picture of the whole spectrum could be obtained, which could in turn be used to calculate a magnitude value that accounts for a wider band. However, a magnitude obtained through this method still wouldn't be comparable to one of our measured values unless we also take into account how the imagers respond to different wavelengths - CCDs are known to respond to colors similar to human vision, meaning the instruments are probably more sensitive to the longer-wavelength end of the visible range of light.

So in order to determine whether the magnitudes are consistent with known values, we need to find a function describing the quantum efficiency of an imager in relation to wavelength, then figure out how to incorporate that information with the visual magnitudes and the color indices, to obtain a single wide-band magnitude value for each star.

2 More working with star data

I continued adding data to the spreadsheet made last week, adding the Whitehorse and Snap Lake data to the existing data from The Pas. As mentioned before, the Snap Lake data is very different from the other two sites, but maintains a similar pattern. Aside from this discrepancy the findings seem to show that it is possible to obtain data that is consistent between sites, using the techniques I've been using so far.