

Documentation for atmospheric transmission code

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April 21, 2016

Intro

This document describes the thought processes, required math, etc. for the code `atmospheric_transmission.py`.

Math

The following is the math carried out to get the atmospheric transmission, a_λ in terms of the user input:

- object magnitude: M_{obj}
- airmass: X

M_{net} is the “net” transmitted magnitude observed from the ground. Equations

$$M_{net} = M_{obj} + kX$$

$$M_{net} - M_{obj} = -2.5 \log \left(\frac{F_{net}}{F_{obj}} \right)$$

$$M_{net} - M_{obj} = -2.5 \log(a)$$

$$a = 10^{\left(\frac{M_{net} - M_{obj}}{-2.5} \right)}$$

$$a = 10^{\left(\frac{kX}{-2.5} \right)}$$