

Limb Darkening and Light Curve Simulation

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Abstract

Light curves are recorded by radio telescopes and are used by astronomers to help better their guesses to existence of exoplanets. In our work we are using the new WASP55 stellar system which is composed of one star and one planet. We want to be able to give the star a more closely related characteristic of limb darkening in which the edges of the surface that is facing us is less bright due to a longer radial distance, meaning photons have a longer path with matter in between to be absorbed into. To produce these light curve plots we will be using Python 3.X. Because python cannot make spectators (like radio telescopes) easily, our “sight” will be a 2d array that holds the information of brightness at all points away from the origin defining the radial distance. We will then simulate a “planet”, making a circle of smaller radius, which crosses our view of the star and carries 0 brightness on all points on its surface. Our iterations of sums of our matrix as the planet moves will produce our light curves.