



## Light Curves and Disk-Averaged Spectra for Terrestrial Planets

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Any planets found by the Terrestrial Planet Finder Mission will be spatially unresolved. Basic information can be gleaned from the object's distance from the star and its apparent brightness, but the presence of a planetary atmosphere of unknown composition will complicate simplistic determinations of planetary properties. Disk-averaged spectroscopy will be our best tool for discriminating between Jovians and Terrestrials, and between Terrestrials of different types. Spectrally-dependent light curves and disk-averaged spectra of extrasolar terrestrial planets will be simulated to determine the detectability of biosignatures by proposed space-based observatories. The seasonal and annual climate variations of plausible terrestrial planets with a range of orbital distances, eccentricities, and obliquities can be simulated using a versatile climate model. A surface/atmosphere radiative transfer model can then be used to generate time-dependent spectra of these environments throughout the annual cycle. These spectra, generated at high spectral resolution, will be averaged over the planet's disk and then convolved with a triangular slit function to a series of lower spectral resolutions to determine whether there is adequate information to assess the planet's habitability and the detectability of biosignatures.

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