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Exoplanet Phase Curve Information Content: Towards Optimized Observing Strategies BEN PLACEK, Wentworth Institute of Technology, KEVIN KNUTH, State University of New York at Albany, DANIEL ANGERHAUSEN, Center for Space and Habitability, University of Bern — Exoplanet phase curves are comprised of two photometric effects: the reflection of incident starlight, and the thermal emission of radiation from the planet's atmosphere or surface. The reflection and thermal emission from the day-side of the planet manifest in photometry as nearly sinusoidal brightness variations as different portions of the day-side wax and wane over the course of an orbit. These effects, although small, are detectable for many short period hot Jupiters and even some super-Earths. Physical mechanisms have been identified which act to shift the phase curve maximum of tidally locked close in planets to the left, or to the right of the secondary eclipse. Using information-theoretic techniques, and Bayesian inference we investigate the most important parts of exoplanet phase curves with two primary goals. First, to determine which parts of the phase curve are important for constraining certain planetary properties such as the albedo, brightness temperature, and bright spot shift, and second to determine if the entire phase curve must be observed to constrain these properties. The latter would have significant implications for optimizing future observing strategies when applying for observation time on next generation telescopes like JWST and CHEOPS.

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