Title:
Phase, Transients, and Oscillators: Dynamics of Circadian Rhythms

Abstract:
Circadian clocks provide endogenously controlled oscillations at the cellular level with a period of approximately 24 hours, allowing the organism to adapt to the day-night rhythms imposed by the environment. The core structure of the Drosophila circadian oscillator derives from negative feedback loops involving period and timeless genes and their protein counterparts. This feedback provides a foundation for robust oscillations as understood by control and system theorists. Through use of formal sensitivity analysis, robustness and fragility properties of such systems may be addressed.