

Abstract Submitted
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Hopf Bifurcations in a Model for Circadian Rhythms in Arabidopsis Thaliana ORRIN SHINDELL, RANDALL TAGG, University of Colorado Denver — Arabidopsis thaliana is a plant used for many fundamental studies, including circadian rhythms. Numerically integrating the 7-equation kinetic model of Locke et al. [J. Theor. Bio. 234 (2005) 383], we have mapped regions of parameter space where circadian expression of key mRNA and proteins undergoes limit cycle oscillation. We seek to relate this to the work of Fukuda et al. [Phys. Rev. Lett. 99 (2007) 098102], where a coupled system of cells individually described by Stuart-Landau equations is used phenomenologically to describe experimentally observed spatio-temporal patterns in the plant leaves. To that end we have done a weakly nonlinear analysis of the system of kinetic equations. We also comment on possible experimental directions to further connect the kinetic models to dynamics in this multi-cellular system.

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