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Emma Smith Zbarsky* (smithzbarskye@wit.edu). *Dynamics of a two patch gravity model.*

In spatial population models, it can be important to include a factor expressing the difficulty of movement between loci. In this paper we consider a model based on gravitational attraction, where the expectation of the rate of dispersal between patches i and j is $E(T_{i,j}) \propto n_i^\alpha n_j^\beta d_{i,j}^{-\theta}$, where n_i and n_j are the populations of patches i and j and $d_{i,j}$ is some measure of difficulty. The standard model of gravity takes $\alpha = \beta = 1$ and $\theta = 2$. We explore the dynamics of such a system as α , β and θ vary with respect to each other. We find both a pitchfork bifurcation and a period doubling bifurcation, as well as a switch between monotonic and oscillatory behavior. (Received September 17, 2013)