1109-39-316 **Chi-Jen Wang*** (cwang463@math.gatech.edu), **Xiaofang Guo**, **Da-Jiang Liu** and **James Evans**. *Lattice differential equation analysis of wave and droplet-like behavior in spatial epidemic models.*

We consider a spatial epidemic model where a population of sick or healthy individual resides on an infinite square lattice. Sick individuals spontaneously recover at rate *p*, and healthy individual become infected at rate O(1) if they have two or more sick neighbors. As *p* increases, the model exhibits a discontinuous transition from an infected to an all healthy state. Relative stability of the two states is assessed by exploring the propagation of planar interfaces separating them (i.e., planar waves of infection or recovery). We find that the condition for equistability or coexistence of the two states (i.e., stationarity of the interface) depends on orientation of the interface. We also explore the evolution of droplet-like configurations (e.g., an infected region embedded in an all healthy state). We analyze this stochastic model by applying truncation approximations to the exact master equations describing the evolution of spatially non-uniform states. We thereby obtain a set of discrete (or lattice) reaction-diffusion type equations amenable to numerical analysis. (Received February 04, 2015)