1124-35-364 **Jerome Goddard II*** (jgoddard@aum.edu), Department of Mathematics & Computer Science, Auburn University Montgomery, P.O. Box 244023, Montgomery, AL 36124, and **R. Shivaji**.

Modeling the effects of U-shaped density dependent dispersal via reaction diffusion equations.

Dispersal is broadly defined as movement from one habitat patch to another and typically is considered to encompass three stages: 1) emigration, 2) inter-patch movement, & 3) immigration. Dispersal can have both beneficial and detrimental effects on the persistence of spatially structured systems. Recent empirical results indicate that certain organisms' emigration from a patch is dependent on their own density—known as density dependent emigration. In fact, a U-shaped relationship between density and emigration has been observed in several organisms in field studies. To date, little is known about the patch-level consequences of such a dispersal strategy. In this talk, we will discuss a population model built upon the reaction diffusion framework that is designed to model the patch-level effects of U-shaped density dependent emigration. In particular, we will discuss the existence and stability properties of positive steady state solutions to this model for one-dimensional habitat patches. A brief discussion regarding ecological conclusions of the model's predictions will also be included. Several methods from nonlinear analysis will be employed such as time map analysis (quadrature method) and linearized stability analysis. (Received September 13, 2016)