1125-35-1078 **Jerome Goddard II**, **Quinn Morris*** (qamorris@uncg.edu), **Catherine Payne**, **Jordan Price** and **R. Shivaji**. *Analysis of steady states for classes of reaction-diffusion equations with U-shaped density dependent dispersal on the boundary.*

We consider positive solutions to equations of the form

$$\begin{cases} -\Delta u = \lambda u(1-u), & x \in \Omega, \\ \frac{\partial u}{\partial \eta} + \gamma\sqrt{\lambda}(u-A)^2 u = 0, & x \in \partial\Omega, \end{cases}$$

where $\lambda > 0, \gamma > 0, A \in (0,1)$ are parameters, $\Omega$ is a bounded domain in $\mathbb{R}^n$; $n \geq 1$ with smooth boundary $\partial\Omega$ and $\frac{\partial u}{\partial \eta}$ is the outward normal derivative. Such models arise in the study of population dynamics in a habitat $\Omega$ when the population exhibits U-shaped density dependent dispersal on the boundary. We analyze the persistence of the population (existence, non-existence, uniqueness and multiplicity of positive solutions) as the patch size ($\lambda$) and the hostility of the outside matrix ($\gamma$) vary. We obtain results when $\Omega = (0,1)$ via a quadrature method, and when $\Omega$ is any bounded domain in $\mathbb{R}^n$; $n > 1$ by the method of sub-super solutions. (Received September 14, 2016)