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Jerome Goddard, Quinn Morris, Stephen Robinson and Ratnasingham Shivaji*
(shivaji@uncg.edu), Dept of Mathematics & Statistics, UNCG, 116 Petty, 317 College Ave,
Greensboro, NC 27412. *An exact bifurcation diagram for a reaction diffusion equation arising in
population dynamics.*

We analyze the positive solutions to

$$\begin{cases} -\Delta v = \lambda v(1 - v); & x \in \Omega_0, \\ \frac{\partial v}{\partial \eta} + \gamma \sqrt{\lambda} v = 0; & x \in \partial\Omega_0, \end{cases}$$

where $\Omega_0 = (0, 1)$ or is a bounded domain in \mathbb{R}^n ; $n = 2, 3$ with smooth boundary and $|\Omega_0| = 1$, and λ, γ are positive parameters. Such steady state equations arise in population dynamics encapsulating assumptions regarding the patch/matrix interfaces such as patch preference and movement behavior. In this paper, we will discuss the exact bifurcation diagram and stability properties for such a steady state model (Received September 05, 2019)