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Junping Shi* (shij@math.wm.edu), Department of Mathematics, College of William and Mary, Williamsburg, VA 23185. *Bifurcations in diffusive predator-prey systems.*

We consider a predator-prey system with Holling type II functional response. The ODE model has a rich dynamics of global asymptotically stable coexistence equilibrium, Hopf bifurcation and globally asymptotically stable limit cycle. For the reaction-diffusion model of the same predator-prey system, we show that multiple bifurcations occur as a parameter changes. Spatial non-homogeneous steady state solutions and periodic solutions bifurcate from the curve of homogeneous steady state solutions. This gives a partial explanation of the complex spatiotemporal dynamics of the model, which has been shown from numerical experiments. The pattern formation here is not Turing type since the diffusion coefficients can be arbitrarily chosen. This is a joint work with Junjie Wei and Fengqi Yi of Harbin Institute of Technology. (Received August 24, 2008)