1014-35-1327 **Anahit Galstyan*** (agalstyan@utpa.edu), Department of Mathematics, University of Texas-Pan American, Edinburg, TX 78539, **Philip Korman** (kormanp@math.uc.edu), Department of Mathematical Sciences, University of Cincinnati, Cincinnati, OH 45221, and **Yi Li** (yli@math.uiowa.edu), Department of Mathematics, University of Iowa, Iowa City, IA 52242. *On the oscillations of the solution curve for a class of semilinear equations.*

Bifurcation phenomena play an important role in natural sciences. They are closely connected to changes in the qualitative behavior of the systems and to changes in stability, as well as to many other problems in physics, chemistry, and biology.

We use the bifurcation theory to investigate a number of positive solutions of the semilinear Dirichlet boundary value problem on a ball in n-dimensional space for the second order elliptic equation with periodic nonlinearity containing a positive parameter. We show that if the dimension n of the variables is less than or equal 5, the problem has infinitely many positive solutions when the parameter coincides with the principal eigenvalue of the Laplace operator. At any other value of the parameter or if the dimension n exceeds 5, the number of positive solutions is at most finite.

Our approach appeals to the well known results of B. Gidas, W.-M. Ni, L. Nirenberg, the bifurcation theorems of M.G.Crandall, and P.H.Rabinowitz and the stationary phase method. (Received September 27, 2005)