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Maya Chhetri, Pavel Drabek and Ratnasingham Shivaji* (r_shivaj@uncg.edu), Dept of Mathematics and Statistics, University of North Carolina at Greensboro, 116 Petty, 317 College Ave, Greensboro, NC 27412. *S-shaped bifurcation diagrams in exterior domains.*

We study a nonlinear eigenvalue problem on the exterior to a simply connected bounded domain in \mathbb{R}^N containing the origin. We consider positive weak solutions satisfying Dirichlet boundary conditions on the compact boundary and decaying to zero at infinity. We discuss multiplicity and uniqueness results of solutions with respect to a bifurcation parameter and conjecture an *S*-shaped bifurcation diagram for positive reaction terms which are singular at the origin and sublinear at infinity. As a by-product, on regions exterior to a ball with radially symmetric weight functions, we obtain radial symmetry of solutions when uniqueness holds. (Received September 20, 2017)