Bifurcation theory for semilinear elliptic boundary value problems

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ABSTRACT. This expository paper is devoted to static bifurcation theory for a class of *degenerate* boundary value problems for semilinear second-order elliptic differential operators stimulated by a problem of chemical kinetics. Our approach is distinguished by the extensive use of the ideas and techniques characteristic of the recent developments in the theory of partial differential equations.

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0. Introduction and results

Let D be a bounded domain of Euclidean space $\mathbf{R}^N$ with smooth boundary ∂D; its closure $\overline{D} = D \cup \partial D$ is an N-dimensional, compact smooth manifold