

Bifurcation of elliptic systems with nonlinearities on the boundary

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We consider a system of elliptic equations with superlinear and subcritical boundary conditions and a bifurcation parameter as a factor. Combining rescaling method, and degree theory, we prove that there exists a connected branch of positive solution bifurcating from infinity when the parameter tends to zero. Moreover, we prove the existence of a connected set of positive weak solutions of our system bifurcating from the trivial solution at the point $\frac{\mu_1}{\sqrt{f_1'(0)f_2'(0)}}$, where μ_1 is the first Steklov eigenvalue and f_i $i = 1, 2$ are the nonlinearities.

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