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A numerical method for multiple solutions of a singularly perturbed semilinear Neumann problem

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ABSTRACT

In this talk, the existence for the numerical solutions and the convergence analysis for the minimax algorithm with $L = \{0\}$ are established in solving a singularly perturbed semilinear Neumann problem. An estimate for the critical value of ε to determine whether $u(x) = 1$ is a ground state is given and proved. Based on it, an efficient algorithm for the model problem is provided. The corresponding numerical results of single-peak and multi-peak solutions are shown to validate the robustness of the algorithm.

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