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Short title: Finite element methods for a bi-wave equation modeling d-wave superconductors.

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Review text:

The authors consider the Poisson's equation with a singular perturbation by the bi–wave operator. The problem, then, is a singular perturbed fourth order partial differential equation. The problem appears, for instance, in d–wave superconductors. The aim of the article is to provide a finite element approximation for such problem. A weak formulation for the problem as well as the existence and uniqueness of the weak solution are presented and justified. A low order conforming non–C^1 finite element method, inspired from the ideas of nonconforming and discontinuous methods, is introduced. An optimal convergence order is proved. Numerical examples to explain the theoretical are presented.