

Curve Veering Phenomenon in Two-Dimensional Eigenvalue Problems

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Abstract

The free vibration of both a beam and a rectangular membrane have been studied in two papers of Young [1, 2]. The results demonstrated that not all approximate solutions produce the phenomenon of curve veering and, moreover, such consequences may also take place when the closed form exact solutions are available. The cause of the veering is coupling which can be introduced implicit by the incompleteness of admissible function as the studies in Young [1], or explicitly by the interaction between the main structure and the substructure as in Young [2]. The primary purpose of this study is devoted to investigate the free vibration of a rectangular plate with various boundary constraints. Both exact and finite difference methods will be utilized. Many plate vibration problems have been solved by finite difference method; however, no known publication investigates if there exists the phenomenon of veering among the eigenvalue loci.

Keyword : Curve Veering, Finite Difference Method