



DEPARTMENT OF APPLIED MATHEMATICS

應 用 數 學 系

**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Colloquium

Finite Element Methods for Eigenvalue Problems

by

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Abstract

The numerical solution of eigenvalue problems is of fundamental importance in many scientific and engineering applications, such as structural dynamics, quantum chemistry, electrical networks, magnetohydrodynamics, and control theory. Due to the flexibility in treating complex structures and rigorous theoretical justification, finite element methods, including conforming finite elements, non-conforming finite elements, mixed finite elements, discontinuous Galerkin methods, etc., have been popular for eigenvalue problems of partial differential equations.

In this talk, we shall introduce finite element approximations for several typical problems including the Dirichlet eigenvalue problem, the biharmonic eigenvalue problems, the Maxwell's eigenvalue problem and the new quad-curl eigenvalue problem. Furthermore, we shall discuss two non-self adjoint eigenvalue problems: the transmission eigenvalue problem and the Steklov eigenvalue Problems. To solve the resulting matrix eigenvalue problems, a new algebraic eigensolver is developed and some recent progresses are presented. The talk provides an up-to-date overview of the finite element methods for PDE eigenvalue problems.

Date : 14 September, 2018 (Friday)

Time : 9:30a.m. – 10:30a.m.

Venue : TU801, The Hong Kong Polytechnic University

*** * * ALL ARE WELCOME * * ***