國立清華大學數學系學術演講
NTHU MATH Colloquium

講題　Tailored Finite Point Methods for Solving Singularly Perturbed Eigenvalue Problems

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時間　2020.11.09 (Mon.) 16:00 – 17:00

地點　Room 101, General Building III

茶會　15:30, R707

Abstract

We study tailored finite point methods (TFPM) for solving the singularly perturbed eigenvalue (SPE) problems. We first provide an asymptotic analysis for the eigenpairs and show that for some special potential functions when ε approaches to zero the square of eigenfunction converges to a Dirac delta function weakly, and the eigenvalue converges to the minimum value of the potential function. For computing the eigenfunction with higher eigenvalue we propose two variants of TFPM for one-dimensional SPE problems and a nonlinear least square TFPM for two-dimensional problems. The eigenfunction with higher eigenvalue can be easily computed on a related coarse mesh on numerical tests, and suggests that the proposed schemes are accurate and efficient for the SPE problems.