



华南数学应用与交叉研究中心
South China Research Center for Applied
Mathematics and Interdisciplinary Studies

CAMIS-SCNU
Lectures

Distinguished Lectures 杰出报告

South China Research Center for Applied Mathematics
and Interdisciplinary Studies (CAMIS), South China Normal University
华南师范大学华南数学应用与交叉研究中心

Guangzhou, China
June 21st, 2019



Speaker: Fanghua Lin (林芳华)

Inviter: Zhouping Xin (辛周平)

Title: Uniform Boundary Controllability and Homogenization of Wave Equations

Time: 15:30-16:30 p.m, June 21st (Friday), 2019

Venue: Room 111 of South China Research Center for Applied Mathematics and Interdisciplinary Studies
华南数学应用与交叉研究中心一楼111学术报告厅

Abstract:

It has been a long standing problem since early 1980s posed by late J.L. Lions that concerning the Uniform Controllability of Wave Equations in highly oscillating (heterogeneous) medium. The identification of the limit of (optimal) controls and the (optimal) control for the homogenized limiting problem; as well as counterexamples to uniform controllability were known since late 1980s and early 1990s. In this lecture, I will discuss my recent joint work with Zhongwei Shen on this problem. We obtain sharp convergence rates, using Dirichlet correctors, for solutions of wave equations in a bounded domain with rapidly oscillating periodic coefficients. The results are used to prove the exact boundary controllability that is uniform in ε - the scale of the microstructure, for the projection of solutions to the subspace generated by the eigenfunctions with eigenvalues less than $C\varepsilon^{-2/3}$. I shall discuss also the related eigenvalues and eigenfunctions estimates which are uniform in ε .

Introduction:

林芳华教授是美国纽约大学柯朗研究所的Julius Silver首席教授，曾于1988-1989和1996-1997任芝加哥大学教授。1989年分别荣获Presidential Young Investigator和Alfred P. Sloan Fellow。1990年，在国际数学家大会上，年仅31岁的林芳华被邀请作大会45分钟学术报告。2002年，荣获美国数学会Bocher奖，2004年获华人数学家大会陈省身奖。2004年被评为美国科学与艺术院院士，并于2015年被评为美国数学会的fellow。

主要研究兴趣包括经典和应用分析，偏微分方程，几何测度论，以及变分运算。著有200多篇学术论文和多本专著：《Elliptic Partial Differential》，《Geometric Measure theory: An Introduction》 and 《The Analysis Of Harmonic Maps And Their Heat Flows》等。

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