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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON APPLIED MATHEMATICS

Passive Imaging with Wave Speed Mismatch: Theory and Wave Speed Estimation

By

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Abstract

In this talk, we consider the problem of estimating the background wave speed from cross-correlations of signals generated by ambient noise sources. A standard approach for imaging reflectors is to apply Kirchhoff-type migration to the cross-correlation data. It is well known that when the back-propagation speed differs from the true wave speed, the reflector is subject to position shifts and defocusing. By introducing the searching wave speed directly into the imaging functional, we develop a quantitative mathematical framework that characterizes these effects, and our analysis leads to a novel estimator for the background wave speed. We further extend the methodology to media with rapidly oscillating acoustic properties, in which the correlation length is much smaller than the typical wavelength, and we propose an estimator for the corresponding effective wave speed. This talk is based on joint work with Prof. Josselin Garnier.

Date : 13 January 2026 (Tuesday)

Time : 4:00p.m. - 5:00p.m.

Venue : Room 3494 (Lift 25/26)

All are Welcome!