



The Hong Kong University of Science and Technology

Department of Mathematics

Seminar on Applied Mathematics

A semiclassical perspective for elastic surface waves: analysis and inverse problems

by

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Abstract

More than a decade ago, Campillo and his collaborators discovered that cross correlation of ambient noises yields Green's function for surface waves. Since then, seismologists began to use these noises to do a "passive imaging" of the geological structure of the Earth. We use a semiclassical framework to describe surfaces in an elastic half space that is stratified near the boundary at some scale comparable to the wave length. The analysis is based on the work of Colin de Verdiere on acoustic surface waves. A one-dimensional ODE operator, parametrized in phase space, have its eigenvalues governing the geometrical behavior of surface waves. An analysis of this ODE operator will be given. Recovery of material parameters from dispersion relations of surface waves can be formulated as an inverse spectral problem for the ODE operator. We investigate the inverse spectral problem for isotropic medium, in which two kinds of surface waves travel, namely, Love and Rayleigh waves. Under certain generic conditions, we give reconstruction schemes for the S-wave speed from Love-wave measurements and Rayleigh-wave measurements respectively.

Date: Friday, 31 May 2019

Time: 4:30p.m. – 5:30p.m.

**Venue: Room 5510, Academic Building,
(Lifts 25-26), HKUST**

All are welcome!