
Semiclassical analysis of surface waves

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Abstract

I present a semiclassical description of surface waves or modes in an elastic medium near a boundary. The analysis is based on the work of Colin de Verdière on acoustic surface waves. The medium is assumed to be essentially stratified near the boundary at some scale comparable to the wave length. Effective Hamiltonians of surface waves correspond with eigenvalues of ordinary differential operators, which, to leading order, define their phase velocities. Using these Hamiltonians, we obtain pseudodifferential surface wave equations. In case of isotropic medium the equations decouple into Rayleigh and Love waves. For Love waves, we obtain a comprehensive analysis of the uniqueness for the recovery of the {S} wavespeed. This is a joint work with Maarten V. de Hoop, Jian Zhai (Rice University) and Gen Nakamura (Hokkaido University).

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