
JOEY ZOU, UC Santa Cruz

The Travel Time Tomography Problem for Transversely Isotropic Elastic Media

I will discuss the travel time tomography problem for elastic media in the transversely isotropic setting. The mathematical study of this problem relates to X-ray tomography and boundary rigidity problems studied by de Hoop, Stefanov, Uhlmann, Vasy, et al., which reduce the inverse problems to the microlocal analysis of certain operators obtained from a pseudo-linearization argument. In the previous works, the authors made strong use of the scattering pseudodifferential calculus, particularly using the inversion theory of elliptic scattering operators. However, in the current setting the analysis is more subtle, as the operators obtained are somewhat degenerate (they resemble parabolic operators in a particular sense, rather than elliptic operators in previous works). In this talk, I will explain the pseudolinearization argument and the qualitative features of the operators obtained, as well as the analysis required to accommodate the slightly more degenerate operators.