Global-COE Frontier Seminar

Radiative transfer of seismic waves: a review

Speaker : Dr. Ludovic Margerin
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Date & Time : 10:00 - 11:00 Aug 12, 2009 on Wednesday
Place : Research Center for Earthquake and Volcanic Eruption
        Annex Bldg. #1 Meeting Room
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Abstract :

The field of multiple scattering of seismic waves is in rapid development with many new applications to tomographic imaging and monitoring of temporal variations. Among the numerous approaches of multiple scattering, radiative transfer is probably the easiest to understand. In this review, I introduce the key concepts of radiative transfer with an emphasis on the relation with the seismic wavefield observations. Starting from a simple scalar model, I present a brief phenomenological derivation of the radiative transfer equation. The coupling between P and S waves is then introduced and several consequences of the radiative transfer equation are explored such as diffusion and equipartition. I will then illustrate the theory with a number of applications including source studies, modeling of volcanic heterogeneity, crustal anomalies and mantle heterogeneity, and Green function reconstruction from coda waves.