論文内容の要旨

論文題目　**Love Wave Excitation by an Accretionary Wedge**

（付加体によるラブ波の励起）

氏　名　　麥琛（**Mak, Sum,** メク　サム）

It was reported that a group of secondary surface wave late phases propagated from the southwest toward the northeast Japan during the 2003 Tokachi-oki earthquake. In this study, Hi-net tiltmeter data for a series of major earthquakes that occurred from 2003 to 2008 in northeast Japan were analysed. It is confirmed that such surface waves (hereafter referred as "coherent seismic coda") are ubiquitous in the coda of a period band of 20 to 40 s for earthquakes occurring in northeast Japan. The properties of the coherent seismic coda were measured through waveform inspection and beamforming. Properties like the peak amplitude, duration, propagation direction and polarization provided hints for the nature of the geological feature that is responsible for generating the coherent seismic coda.

Back-projection of wave propagation directions obtained through beamforming suggested that the coherent seismic coda originated from offshore southeast to Kyushu. This region features an accretionary wedge along the Nankai Trough, and some submarine seamounts. Numerical simulations were performed and the properties of the synthetic seismic waves scattered by the two types of structure were measured and compared with those measured form the observation. The seamounts were found to be a relatively weak scatterer that produced a short pulse of scattered waves. On the other hand, synthetic scattered waves

generated at a heterogeneous accretionary wedge possessed properties comparable to the observation. For the simplest case, the velocity anomaly of a heterogeneous accretionary wedge was modelled as a rectangular inclusion in a homogeneous background. The size of the inclusion was found to be related to the frequency content and the duration of the scattered waves.

The result of waveform simulations suggests that the exceptionally soft accretionary wedge at the western Nankai Trough is the major reason for the spectacular observation of the coherent seismic coda. Due to the shape of the low velocity zone, seismic wave incidence from other directions is expected to produce observable but less conspicuous scattered waves. Mountain ridges have been often used to explain anomalous reflections found in seismograms in various cases. This study demonstrates that a heterogeneous accretionary wedge could be another candidate, and enhances the understanding of wave propagation across a subduction zone.