# Characteristics of Tsunami Coda Observed in Japan due to the 2006 Kuril Islands Earthquake

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## 1. Introduction

The Kuril Islands earthquake, which occurred on November 15, 2006, resulted in a tsunami on the Pacific coast or the Sea of Okhotsk of Japan. Tidal stations along the coast recorded the largest tsunami amplitude more than 5 h after the initial tsunami wave. It was proved that such later phases were affected by scattered waves excited by the Kinmei Seamount located at the southernmost tip of the Emperor seamounts (Koshimura et al., 2008). This study aims to describe the characteristics of the observed later phase, which is necessary for proper cancellation of a tsunami warning. In this paper, a waveform observed after the maximum amplitude detected is called as tsunami coda.

## 2. Data

Sea-level data from 30 tidal stations along the Pacific coast or the Sea of Okhotsk and an ocean-bottom gauge off Boso peninsula were employed. These stations are operated by the JMA; sea-level data are sampled at intervals of 1 min. The effects of the astronomical tide were eliminated.

## 3. Attenuation of tsunami in coda

The damping time constants of the square sum of the tsunami coda amplitude were calculated at each station. The constants (approximately 9 to 10 h) were almost equal in the Pacific coast from Hokkaido to Kyushu. This implies that the average amplitude in tsunami coda halved in about half a day in this region.

## 4. Probability distribution of normalized tsunami amplitudes

The probability distribution of the normalized tsunami amplitude, which is defined by the zero-cross-up method and the time constant of coda, is calculated. The stochastic model that best explains the distribution is selected from amongst the most likelihood normal, the most likelihood log-normal, and the Rayleigh distributions by comparing the corrected Akaike's Information Criteria. At more than half the stations, the Rayleigh distribution is selected as the optimal stochastic model for the appearance frequency of normalized tsunami height in coda.

## 5. Summary

The characteristics of tsunami coda observed in Japan due to the 2006 Kuril Islands earthquake are summarized as follows. The averaged amplitude in tsunami coda decays exponentially with time. However, in the decay processes, the time series of the observed amplitude at the tidal stations have fluctuations. Therefore, a wave with amplitude that is 2 to 3 times the average amplitude can sometimes be detected.

Reference
Koshimura, S., Y. Hayashi, K. Munemoto, and F. Imamura, 2008, Geophys. Res. Lett., 35, L02611, doi:10.1029/2007GL0321295.