

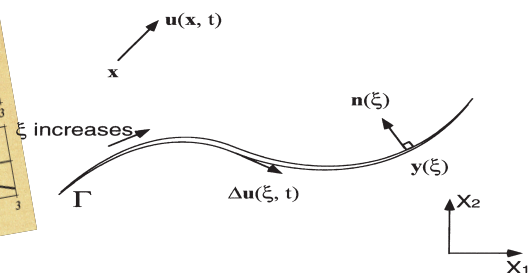
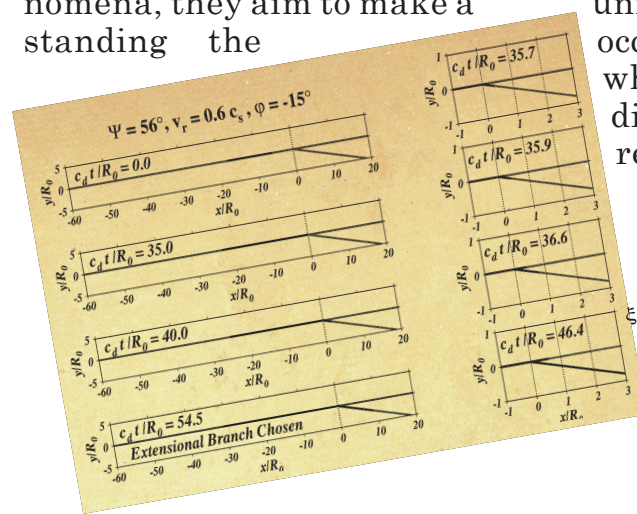
Towards physics based earthquake occurrence

How does earthquake occur?

Prof. Teruo Yamashita and Associate Prof. Nobuki Kame have been trying to breakthrough this challenge by using mathematical approach.

Occurrence of earthquake involves multiple complicated causes. Finding the patterns hidden behind this complicated phenomena, they aim to make a standing the

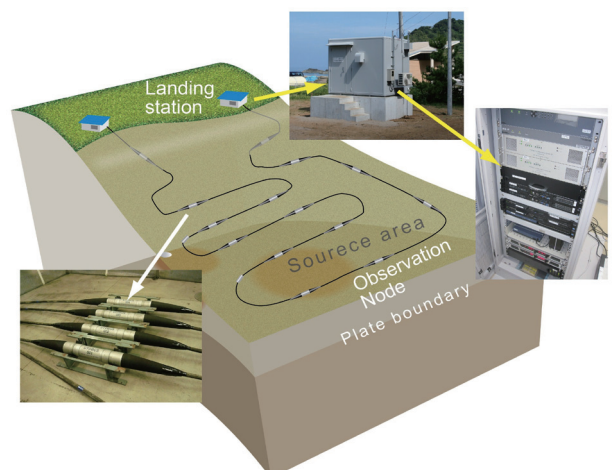
unified framework for under-occurrence of earthquakes, which may lead to the prediction of earthquake occurrence.



The evolving Ocean Bottom Seismometer

Most of the massive earthquakes that occur in Japan are triggered on the ocean floor. It is vital to observe on site, in order to make detailed investigation of seismic activities. Ocean Bottom Seismometer (OBS) was developed to meet this demand. Japan holds 40 years of history in developing OBS; Japanese OBS is the best in quality and the largest in numbers. However, OBS is still on its way of evolution. Recently, a new observation system using a cable has been developed; with micro-OBS (about the size of 2 litre pet bottle) deployed at 20km intervals, on the ocean floor.

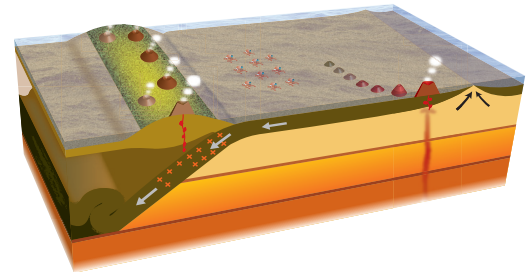
Not only the mechanism of earthquake occurrence may be revealed, but also it may improve the speed and accuracy of the Earthquake Early Warning System, eventually contributing to the mitigation of earthquake disasters.



Towards the understanding of the mantle dynamics with an innovative observational approach

This project seeks answers for the two fundamental questions in Earth Science: what is the physical condition for the lithosphere-asthenosphere boundary (LAB)? Is the mantle transition zone (MTZ) a major water reservoir of the Earth? In addition to various seismological data analysis methods to generate high resolution maps, this project uses 3D electrical conductivity inversion and anisotropic conductivity inversion to obtain additional constraints on the presence and configuration of water and/or melt in the upper mantle, down to the MTZ depth.

Thus obtained variety of geophysical information will be envisaged to construct a new model of the oceanic mantle, making a significant contribution to the knowledge on the structure and dynamics of the mantle.



Multi-disciplinary Hazard reduction from Earthquakes and Volcanoes in Indonesia sets off

"Multi-disciplinary Hazard reduction from Earthquakes and Volcanoes in Indonesia", a collaborative research project between



Japan and Indonesia, began in April 2009. This huge project involves more than 20 research institutes from both countries. With multidisciplinary approaches, including vast variety of fields such as science, civil-engineering, sociology, pedagogy, etc., this project aims to mitigate earthquake and volcanic disasters, and then feed back and make use of these results in the society.

"Our ultimate goal is to contribute to the disaster mitigation in all Asian countries, spreading out what we may achieve from this project with Indonesia" says Prof. Kenji Satake, the head of the project on Japan side.