

## Incoming plate to subduction zones: what we know and what we do not know

# Shuichi Kodaira[1]; Ryota Hino[2]; Natsue Abe[1]

[1] IFREE, JAMSTEC; [2] RCPEV, Graduate School of Sci., Tohoku Univ.

Recent advancements of marine geophysical investigations, in collaboration with geochemical and geological studies, have been discovering new findings for understating geodynamic processes in subduction zones around Japan. For example, inter-plate structures controlling a generation of a great mega-thrust earthquake, serpentinization of a mantle wedge and its relation to subduction seismicity, along/across intra-oceanic arc structural variation reflecting crustal growth processes. In addition to those studies, the IODP drilling has been carrying out in the Nankai seismogenic zone to test hypotheses partly proposed on the basis of those studies. On the other hand, little is known about geophysical characters of an oceanic crust/mantle before subduction; i.e., an incoming plate. Although investigating an incoming plate has been believed to be fundamental for understanding many key geodynamic processes around subduction zones, there has been only a few geophysical study after a pioneer work in 1970th. We believe that a state of arts of geophysical techniques including active/passive seismic surveys can image, document, describe and interpret the geodynamic process of an incoming plate, which is closely linked to processes after subduction. For example, 1) outer-rise faulting related to a generation of a great tsunami earthquake, 2) hydration of an oceanic crust/mantle due to the outer-rise faulting, which may controls inter-plate seismicity, 3) alternation/deformation of the oceanic crust/mantle for a possible origin of recent magmatisms after late Miocene on the Cretaceous Pacific plate ( Petit-spot), etc. Another important aspect of studying an incoming plate is to describe detailed seismological structures of normal oceanic crust and Moho. This would provide necessary information for a future Mohole drilling project, even though a proposed site of the Mohole, at this moment, is around the East Pacific Rise. In this presentation, we summarize our knowledge of geophysical characters concerning the topics above based on recent studies, and propose future perspectives for studying structures and activities of an incoming plate by using the most advanced marine geophysical techniques.