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Estimations of seismological structure in the northwestern Pacific using OBS records: Approaches from >1 Hz component

TONEGAWA, Takashi[1*] ; FUKAO, Yoshio[1] ; FUJIE, Gou[1] ; TAKAHASHI, Tsutomu[1] ; KODAIRA, Shuichi[1] ; SUGIOKA, Hiroko[1] ; ITO, Aki[1]

[1]JAMSTEC

Tentative ocean bottom arrays using seismometer, hydrophone and pressure gauge have recently been deployed through many scientific projects all over the world. However, in Japan, a permanent ocean bottom monitoring system, called DONET, is now working, and dense cabled-OBSs (ocean bottom seismometers) have been constructed around the Japan Trench. It seems that, compared to other countries, such environments in Japan potentially give us some advantages for investigating the Earth ' s interior, seismic activity, and wavefields under the ocean. In order to easily kickoff the use of these records, it would be better to know characteristics of wavefields observed at seafloor.

A large amplitude in the frequency range of 0.07-0.5 Hz can be often seen in the spectrum of noise record observed at seafloor, which is known as microseisms that are generated by wind propagating sea surface. This large amplitude also emerges at land observation. At frequencies longer than 0.02 Hz in the spectrum observed at typical broadband OBS, the amplitude of infragravity wave is strong in the vertical component, and that of tilt effect is dominant in the horizontal component.

In this presentation, avoiding the use of such longer period components, we focus on shorter period components than 1 Hz of records observed at OBSs. We introduce what kind of analyses we can do hereafter with permanent OBS records, which is based on the use of records observed at tentative ocean bottom arrays. In particular, we will introduce ambient noise and receiver function analyses, in which short period components are mainly used.

Keywords: OBS records, short period components, receiver function, seismic interferometry