

Influence of a subducting ridge on the distribution of shallow VLFs in the Nankai Trough as revealed by moment tensor inversion and cluster analysis

*Akiko Toh¹, Wan-Jou Chen², Nozomu Takeuchi⁴, Doug Dreger³, Wu-Cheng Chi², Satoshi Ide¹

1. EPS, Univ. of Tokyo, 2. IES, Academia Sinica, 3. BSL, UC Berkeley, 4. ERI, Univ. of Tokyo

The eastern Nankai Trough is a unique site where many shallow, very low frequency earthquakes (sVLFs) are recorded by nearby broadband ocean bottom seismometers. Here, we estimated the locations and seismic moment tensors (MTs) of sVLFs based on the low frequency (< 0.06 Hz) components of the records. Although some sVLFs exhibited long duration signals (> 100 s), which indicated a degree of source complexity, the MT inversions were limited to events with impulsive short duration signals (20–30 s). Nevertheless, cluster analysis confirmed that the results obtained for the impulsive sVLFs reasonably represented their distribution in the region. The distribution of MTs indicates that the deformation that accompanies sVLFs is influenced by a subducted ridge in this region, which produces an along-the-trough variation in a strain accumulation/release pattern, and probably controls the spatial patterns of tsunami generation.

Keywords: Nankai Trough, Very low frequency earthquake, Subducted seamount