

Tsunami Recorded by Broadband Seismometer on Pacific Ocean Island

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Tsunami is observed by direct measurement of ocean water level with tide gauge, GPS and pressure gauge. On the other hand, broadband seismic observation in island records strong seism associates with ocean wave. Yuan et.al. (2005) and Nawa et.al.(2007) report broadband seismic signals due to loading by tsunami of 2004 Sumatra-Andaman earthquake.

Our seismic network covers wide frequency range until tidal wave band. And a channel of sensor outputs is flat response to gravity and ground tilt variation at zero frequency. Chichi-jima station (OGS/PS), Bonin islands, locates at fine soil and vault condition. On Jan.3, 2009(UTC), Northern coast of Papua, Indonesia, earthquake(Mw7.6) excited tsunami and tide gauge at Chichi-jima recorded about 40cm height tsunami by JMA report. OGS seismic station also recorded ultra low frequency signal after major seismic ground motion. The arrival time of the signal is same with tide gauge record and signal feature is similar. It is interpreted that tsunami causes some variation in load balance surrounding island.

We reviewed seismic and tide gauge records as for major earthquakes at last five years. A simple linear relation between tsunami height and magnitude of tilt is found clearly. The ability of tsunami detection by seismic sensor is same level with tide gauge. It is caused that the background noise in tilt component is also strongly related with tidal variation. It will be useful that broadband seismic records will supply tsunami signal at ocean island where does not have tide gauge and other water level measurements. We also discuss the possibility to detect tilt change preceding tsunami arrival on site and site sensitivity to tidal variation for Pacific seismic stations.

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Keywords: tsunami; broadband seismogram;

References

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