

High resolution barometer array and broadband seismic observation in Palau

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We are operating high resolution barometer array in Palau and reported atmospheric gravity wave and performance of array analysis in this project (Ishihara et. al., JpGU, 2014). Palau locates in tropical zone and weather condition almost stable every day. This array has good condition to detect event-like signal in stable ambient condition. And broadband seismic stations, weather radar station and NOAA station are operated in Palau. For interpretation of event-like signal, we can use integrated data with some observation data in convenient research field. We are operating two seismic stations. However vertical component of STS-1 sensor had severe problem in its measurement. Last we repaired the component. We started full spec observation as original plan and they are under operation smoothly now.

Over 100 sec in period, atmospheric gravity waves recorded frequently in barometer array. Theoretically signal intensity of gravity wave is decreased in some ten seconds in period. In recent measurement, remarkable some ten seconds pressure variation is detected and propagated in this barometer array. Apparent velocity is also similar with gravity wave and accompany with longer period signal. It is interpreted as one of gravity wave.

In seismic signal, horizontal components detect similar signal and initiate just same time with pressure data. Vertical component doesn't show remarkable signal, so that ground tilt is occurred by pressure variation. Rain fall is also one of sources of ground tilting. However NOAA weather station that is close to a seismic and barometer station does not report heavy rain-fall and small shower in each region. Both phases of seismic and barometer is quite synchronized. Filtered barometer signal shows many high-frequency event-like signals covering all stations. Most cases associate with ground tilting recorded in seismic data. It means that horizontal components include ground tilting as noise until some ten seconds. We will evaluate coefficient of conversion from pressure variation to ground tilting and possibility of reduction of the component. And we will report the characteristics of wide frequency range propagating barometer signal.

Keywords: atmospheric gravity wave, broad band seismic record, ground tilting