

Survey of ground noise during stormy weather in Okinawa region

Toshio Kusano¹, Yutaka Nakama¹, Masahiko Noda¹, Hiroshi Yamashiro¹, Yoshiharu Kawajo¹,
Tadashi Inaba¹, Yasuhiro shimoji¹, *Akio Katsumata²

1. Okinawa Regional Headquarter, JMA, 2. Meteorological Research Institute, JMA

It is well known that the number of detected earthquakes is less during stormy weather such as typhoons compared with that in fine weather in Okinawa region. Horimoto et al. (2016) showed the detectivity got lower due to high ground noise during a storm or a typhoon was passing near the Okinawa Islands. Whereas the felt earthquakes were detected even during the stormy weather, the detectable magnitude level increased by about one as earthquake magnitude. To reduce the effect of the bad weather, application of filter is considered to be effective to keep the detection level.

In this study, wind speed, oceanic wave height, and period of oceanic wave were referred to as indicators of the bad weather. As to the wind speed, the period of the wind speed (ten-minute interval value) larger than 15m/s was considered to be the stormy weather. Significant wave height more than 3 m and Significant wave period more than 10 s are also used as the threshold of the stormy weather. We used data of Itokazu station for the wind speed, and wave height and period at Hana NOWPHAS of Ports and Harbor Bureau. We retrieved 20 minute interval seismic wave data at the Tamagusuku seismic station.

We show two examples of the seismic data under the condition described above.

1) Nov. 27, 2015. Wave height greater than 3m.

A continental anticyclone was covering this region, and wave height of 4.18 m was recorded at Naha. The spectrum of 20 minute interval at Tamagusuku station showed peaks at 1 Hz and 3 Hz.

2) Dec. 17, 2015. Wave period longer than 10 s.

A continental anticyclone was covering this region, and significant wave period of 10.0 s was recorded at Naha. The spectrum of 20 minute interval at Tamagusuku station showed a peak at 1 Hz.

We will increase examples of seismic data during stormy weather, including data in Miyakojima and Ishigaki Islands.

Keywords: seismic noise, stormy weather, detectivity of earthquakes