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# Wave climate monitor system by inland seismometers

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This is the first monitoring system of ocean waves observed by inland seismometers of Taiwan. It has been well known that microseism in the frequency band from 0.05 to about 1 Hz results from ocean waves. Microseisms are continuous ground oscillations recorded at seismometers and wildly introduced for decades which have been explained by Longuet-Higgins [1950] for secondary microseism. The generation mechanism is commonly based on the nonlinear wave-wave interaction to excite pressure pulse into the seafloor. The resulting pressure fluctuation into the seafloor yields the continuous ground oscillation at the double frequency (DF) of ocean waves of the same frequency. In order to understand the characteristics of DF microseism associated with different wave sources, we aim to analyze and interpret the spectra of DF microseism by using the simple spectrum method [Rabinovich, 1997]. This method is applied to identify wave sources by estimating the spectral ratios of wave induced microseisms associated with local winds and typhoons to background spectra. Microseism amplitudes above 0.2 Hz show a good correlation with wind-generating waves near coasts. Comparison of microseism band between 0.1 and 0.2 Hz with buoys in the deep sea shows a strong correlation of seismic amplitude with storm generating waves, implying that such energy portion originates at the remote regions. Results indicate that microseism observed at inland sites can be a potential tool of tracking typhoon motions and monitoring marine extreme waves in real time.