

Ocean waves-induced magnetic effects in Taiwan

*Chun-Rong Chen¹, Chieh-Hung Chen², Jing-Yi Lin¹, Horng-Yuan Yen¹, Peng Han⁴, Che-Chien Chao³

1. Department of Earth Sciences, National Central University, 2. Institute of Geophysics and Geomatics, China University of Geosciences, 3. Department of Earth and Environmental Sciences, National Chung Cheng University, 4. The Institute of Statistical Mathematics, Tokyo

12 magnetic stations routinely monitor changes in the geomagnetic total intensity field are utilized in this study to examine magnetic ocean wave effects in Taiwan. The time-varied magnetic data are transferred into the frequency domain via the Fourier transform to investigate the frequency characteristics associated with ocean waves. Significant enhancements can be found from spectrums in the frequency band of about 0.05–0.3 Hz at stations located very close to the seashore. Frequency characteristics of magnetic data were compared with them of significant wave heights monitored using nearby meteorological observation buoys. The agreement in the frequency characteristics suggests that the magnetic field is affected by ocean waves directly hitting the seashore in open oceans. In contrast, ocean waves with the double-frequency recorded by the marine metrological buoys reveal the locally dominate wave-wave interaction around bays.

Keywords: Ocean waves, Magnetic disturbance, Microseisms