



Seasonal Variations of Microseism Sources Inferred From Noise Polarization

M. Schimmel (1), E. Stutzmann (2), and J. Gallart (1)

(1) Institute of Earth Sciences Jaume Almera - CSIC, Barcelona, Spain, (2) Institute Physics of the Earth - ICGP, Paris, France

In the present study, we focus on the microseismic noise which are caused by ocean wave energy coupling into seismic energy. We quantify, analyze and characterize the frequency-dependent ground motion recorded by the global seismic network GEOSCOPE. The time-frequency dependent noise polarization has been extracted for seven years of continuous three-component broadband records. The data processing consisted in the removal of the instrument responses and the determination of the time-frequency dependent degree of polarization and other attributes such as the linearity and the back azimuths of particle motion.

We show that the microseismic noise is polarized throughout the year and that the back azimuths at most stations vary seasonally, indicating that the noise arrives from the North in Northern hemisphere winter and from the South in Southern hemisphere winter. The measured back azimuths have then been used to determine the generation areas of the secondary microseisms at global scale. There exists a yearly periodicity in the microseismic source locations which is driven by the seasonal swell generation which mainly happens at high latitudes in the Northern and Southern hemisphere during their respective winters.