



## Seismic noise characteristics in Chinese mainland

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Using the three-component continuous waveform recordings of 880 broadband seismic stations in China Seismic Network from January 2014 to December 2015, we calculated power spectral densities and probability density functions over the entire period for each station and investigated the characteristics of seismic noise in Chinese mainland. The deep analysis on the vertical recordings indicates that the spatial distribution of noise levels is characterized by obvious zoning for different period bands. Densely populated areas have higher short-period noise level than sparsely populated ones, suggesting that short-period noise is related to the intensity distribution of human activities such as transportation and industry. Meanwhile the short-period noise level near the basin is higher than the mountainous areas which is probably caused by the amplification effect of the sedimentary layer. The microseism energy gradually decreases from the southeastern coastal lines to the inland regions. Furthermore, horizontal-component noise level showed a striking contrast with the vertical component at microseismic and long-period bands. In consideration of the zoning characteristics and the need of seismic observations, high and low noise models were acquired for each network, which were proved to be a more effective tool to identify locally abnormal signals including earthquake, instrumental error and various disturbance compared with the global new high and low model.