

Development of a standard background noise model for broadband seismic stations of KMA

Beom-Jun Cho[1]

[1] NIMR/KMA

Background noise can be one of the major factors disturbing seismic stations, and study on back-ground noise is needed to improve the data quality. Because the frequency spectral characteristics of background noise vary with observational environment and basement condition, the analysis on the characteristics is necessary for raising the reliability of seismic data. In this study we developed the standard background noise model of 13 broadband seismic stations operated by the Korea Meteorological Administration (KMA) using a continuous data set from January 2007 to December 2008.

For the analysis, we used the Probability Density Function (PDF) method using Power Spectral Density (PSD) proposed by the U. S. Geological Survey (USGS) (McNamara and Buland, 2004). Because we used continuous data, the results involve the effects of far-field earthquakes as well as local events. However they do not much affect our model because we used PDF and the earthquakes do not occur frequently. Furthermore the results show the general characteristics of background noise of the seismic stations. In most stations we could see the significant variations of noise level in the frequency band influenced by cultural noise at around 6 a.m and 6 p.m local time.

We developed the standard background noise model of broadband seismic stations of KMA using minimum and mode of calculated all PSD. The model showed similar noise levels to New High Noise Model (NHNM) and New Low Noise Model (NLNM) provided by USGS, but the secondary-microseism peak seems to shift to higher frequency than that of USGS model.