



Origin of the secondary microseism in South Korea

D.-H. Sheen, J. S. Shin, and T.-S. Kang

Korea Institute of Geoscience and Mineral Resources, Daejeon, Republic Of Korea (dhsheen@kigam.re.kr)

Known as the secondary microseism or the double-frequency peak, a strong peak in the frequency range of 0.1 – 0.5 Hz is well observed throughout the world. The secondary microseism is thought to be generated by nonlinear interaction of direct and reflected ocean waves and travels as Rayleigh waves. In the previous study, the variations of seismic background noise in South Korea have shown that seasonal variations are observed well in the frequency range of 0.1-0.5 Hz and the likely source region of the microseism is located in the Southern Sea of Korea. In this study, we located the source region of the secondary microseism in South Korea by computing back azimuth of ambient seismic noise records and correlating the records. Polarization analysis of three component seismograms was applied to estimating back azimuth of the microseism. Grid search method determined the source region with back azimuths at each station. Back azimuth of the microseism may have difficulty in deciding the true direction because of 180 degree ambiguity of the polarization analysis. Therefore, the true direction of the microseism was confirmed by correlating seismic noises. From this study, we find that the dominant source region of the secondary microseism in South Korea is not stationary but varies seasonally. In winter, the dominant microseismic energy comes from the east to south-east of the Korean Peninsula while comes from the south of the Peninsula in summer.