

Dynamic Basement Amplification Characteristics of Dam Site using Reference Site Method

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Observed ground motions are composed of 3 factors such as, seismic source, attenuation, and site amplification effect. Among them, site amplification characteristics should be considered significantly to estimate seismic source and attenuation characteristics with more confidence. Site effect is also necessary to estimate not only seismic hazard in seismic design engineering but also rock mechanical properties. This study applied the method of H/V spectral ratio of observed ground motion between target site and reference site, namely reference site method. In addition to using vertical Fourier spectrum of reference site, this study tried newly to use horizontal Fourier spectrum. This study analyzed H/V spectral ratio of 6 ground motions respectively, observed at 4 nearby sites at Yedang Reservoir. And then, site amplification effects at each site, using 3 kinds of seismic energies, that is, S waves, Coda waves energy, and background noise were compared each other. The results suggested that each site showed similar site amplification patterns among S waves and Coda waves energy. However, site amplification of background noise showed much different characteristics from those of S waves and Coda waves energy, suggesting that background noises at each site has its own developing mechanism. Each station showed its own characteristics of specific resonance frequency and site amplification properties in low, high and specific resonance frequency ranges. Comparison of this study to others using different method can give us much more information about dynamic amplification of sites characteristics and site classification.

Keywords: S wave, Coda wave, background noise, H/V spectral ratio, resonance frequency, reference station