

Effect of Scarp Topography on Seismic Ground Motion

Authors : Haiping Ding, Rongchu Zhu, Zhenxia Song

Abstract : Local irregular topography has a great impact on earthquake ground motion. For scarp topography, using numerical simulation method, the influence extent and scope of the scarp terrain on scarp's upside and downside ground motion are discussed in case of different vertical incident SV waves. The results show that: (1) The amplification factor of scarp's upside region is greater than that of the free surface, while the amplification factor of scarp's downside part is less than that of the free surface; (2) When the slope angle increases, for x component, amplification factors of the scarp upside also increase, while the downside part decrease with it. For z component, both of the upside and downside amplification factors will increase; (3) When the slope angle changes, the influence scope of scarp's downside part is almost unchanged, but for the upside part, it slightly becomes greater with the increase of slope angle; (4) Due to the existence of the scarp, the z component ground motion appears at the surface. Its amplification factor increases for larger slope angle, and the peaks of the surface responses are related with incident waves. However, the input wave has little effects on the x component amplification factors.

Keywords : scarp topography, ground motion, amplification factor, vertical incident wave

Conference Title : ICSEVAE 2017 : International Conference on Structural Engineering, Vibration and Aerospace Engineering

Conference Location : Istanbul, Türkiye

Conference Dates : September 28-29, 2017