

Study of Effects of 3D Semi-Spherical Basin-Shape-Ratio on the Frequency Content and Spectral Amplitudes of the Basin-Generated Surface Waves

Authors : Kamal, J. P. Narayan

Abstract : In the present work the effects of basin-shape-ratio on the frequency content and spectral amplitudes of the basin-generated surface waves and the associated spatial variation of ground motion amplification and differential ground motion in a 3D semi-spherical basin has been studied. A recently developed 3D fourth-order spatial accurate time-domain finite-difference (FD) algorithm based on the parsimonious staggered-grid approximation of the 3D viscoelastic wave equations was used to estimate seismic responses. The simulated results demonstrated the increase of both the frequency content and the spectral amplitudes of the basin-generated surface waves and the duration of ground motion in the basin with the increase of shape-ratio of semi-spherical basin. An increase of the average spectral amplification (ASA), differential ground motion (DGM) and the average aggravation factor (AAF) towards the centre of the semi-spherical basin was obtained.

Keywords : 3D viscoelastic simulation, basin-generated surface waves, basin-shape-ratio effects, average spectral amplification, aggravation factors and differential ground motion

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020