Simulation of Basin Transduced Surface Waves Using Finite-difference Method

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Rayleigh waves with high frequency content are generated when focal depth is shallow. If, these Rayleigh wave enter into a basin, a part of its energy is reflected back and rest is transmitted into the basin, these types of surface waves inside the basin known as 'Basin-Transduced Surface wave'. Analysis of simulated results revealed a complex mode transformation of BTR-wave after entering in to the basin from the surrounding rocks. The Fundamental and first mode of Basin-Transduced Rayleigh wave (BTR-wave) in the basin were observed. The fundamental mode of BTR-wave was highly dispersed in nature and retrograde vertically polarised and was moving with a lower velocity. On the other hand, less dispersed first mode was retrograde horizontally polarised and was moving with a larger velocity. Amplitude of first mode was more than that of fundamental mode. So, we can conclude that horizontally polarised first mode may be more damaging. The amplification of horizontal component of BTR-wave was around twice to that of the vertical component. An increase of dispersion of BTR-wave with increase of basin edge slope was obtained. Finally it is concluded that only horizontal component of BTR-wave was sensitive to the change of basin-edge slope and impedance contrast.
Key words: Basin-edge effect, Basin transduced surface waves

References

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