



Visco-elastic Boundary Conditions for Multiple Excitation Sources in the Time Domain

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Transmitting boundaries are important for modeling the wave propagation in the finite element analysis of dynamic foundation problems. In this study, visco-elastic boundaries for multiple seismic waves or excitations sources were derived for two-dimensional and three-dimensional conditions in the time domain, which were proved to be solid by finite element models. Then, the method for equivalent forces input of seismic waves was also described when the proposed artificial boundaries were applied. Comparisons between numerical calculations and analytical results validate this seismic excitation input method. The seismic response of subway station under different seismic loads input methods indicates that asymmetric input seismic loads would cause different deformations from the symmetric input seismic loads, and whether it would increase or decrease the seismic response depends on the parameters of the specific structure and surrounding soil.