Two- and Three-Dimensional Effects on Ground Motion

by Apostolos Papageorgiou

Abstract

Geologic conditions and topography at, or near, a site are known to exert a very significant influence on the nature of ground shaking, and their importance on seismic hazard has long been recognized. In particular, sedimentary deposits in the form of sediment-filled valleys or basins very often have a pronounced effect on the intensity of strong ground motion. The finite lateral extent of the sedimentary deposit introduces complex effects through the generation of surface waves (referred to as *locally generated (or valley induced) surface waves*) at the edges and resonance in the lateral direction, and tends to increase both the *amplitude* and the *duration* of the ground motion. Therefore, for the correct interpretation and/or reliable prediction of strong ground motion, as much insight as possible must be gained about the response of these geologic structures. This can be accomplished by theoretical modeling and by comparing/validating the predictions of theoretical models with recorded data.

Collaboration

Apostolos S. Papageorgiou
Rensselaer Polytechnic Institute

Duoli Pei and Bin Zhang
Doctoral students
Rensselaer Polytechnic Institute