

The role of vertical ground motion components in the epicentral area of a buried source: insights from numerical modelling

Giacomo Peruzzi (1), Dario Albarello (1), Stefano Grimaz (2), and Petra Malisan (2)

(1) Dipartimento di Scienze Fisiche, della Terra e dell'Ambiente, Università di Siena, Italy, (2) SPRINT-Lab, Dipartimento Politecnico d'Ingegneria e Architettura, Università di Udine, Italy

In current seismic codes, vertical components accounted for in anti-seismic design are considered to be a fraction of the horizontal ones and are supposed to play a minor role in the definition of damages expected in existing structure. However, observations carried out during last important seismic events in Italy (L'Aquila, 2009; Emilia-Romagna, 2012) demonstrate that these vertical components were larger than those expected on the basis of current hazard estimates and played an important role in damaging specific structures (masonry buildings, churches, industrial warehouses, etc.) located in the epicentral area. In order to provide a more correct estimate of seismic hazard in the near field, numerical simulations have been carried out to explore features of the vertical ground motion at the top of a sedimentary cover overlying a buried seismogenic source. Outcomes of the considered models indicate that a revision of current codes is mandatory to reduce possible underestimates of the local seismic hazard and address suitable retrofitting procedures for existing structures.