

Numerical Modeling of the Seismic Site Response in the Firenze Metropolitan Area

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Abstract : OpenSWPC was used to model 2D and 3D seismic waveforms produced by various earthquakes in the Firenze metropolitan area. OpenSWPC is an Opens source code for simulation of seismic wave by using the finite difference method (FDM) in Message Passing Interface (MPI) environment. it considered both earthquake sources, with variable magnitude and location, as well as a pulse source in the modeling domain, which is optimal to simulate local seismic amplification effects. Multiple tests were performed to evaluate the dependence of the frequency content of output modeled waveforms on the model grid size and time steps . Moreover the effect of the velocity structure and absorbing boundary condition on waveform features (amplitude, duration and frequency content) where analysed. Eventually model results are compared with real waveform and Horizontal-to-Vertical spectral Ratio (HVSR) , showing that seismic wave modeling can provide important information on seismic assessment in the city.

Keywords : openSWPC, earthquake, firenze, HVSR, seismic wave

Conference Title : ICACE 2025 : International Conference on Architectural and Civil Engineering

Conference Location : Florence, Italy

Conference Dates : May 17-18, 2025