



Amplitude variability of ground motions of European dense arrays

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Spatial variability of seismic ground motions (SVGGM) denotes the differences between two time histories of the ground motion recorded at different locations, generally at the ground surface. The modeling of SVGGM and the understanding of its influence on the structural response are necessary so as design codes start to incorporate its effects in their provisions. SVGGM may be quantified by means of amplitude variability using the standard deviation of difference of Fourier amplitudes. This study presents the estimation of amplitude SVGGM using

various in-situ rock and soil site measurements. The earthquake data comes from seismological experimental campaigns that have taken place on different countries in Europe. The dense arrays are the rock and soil site arrays in Argostoli, Greece, the soil site array in Grenoble, France, the soil site array in Fucino, Italy and the hard rock site array in Saint Guirin, France. The subset of events that has been selected for each of the arrays, consists of low to moderate magnitude local and regional earthquakes. Amplitude SVGGM is quantified for each site and comparisons are made, providing a valuable insight into the physics behind ground motion variability. Correlation of the amplitude variability with the available V_s profiles of the sites is attempted. A commonly used parametric model of amplitude SVGGM is also compared to in-situ observations. The findings of the present research are contributing to enhance our understanding of SVGGM at different site conditions and proposing variability models to be used in structural design.