



Geophysical characterization of the Zafarraya Basin (south of Spain) and modelling of its seismic response for incident elastic waves

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In the summer of 2004, a set of 86 microtremor measurements was made on a regular grid of 500 x 500 m covering the whole surface of the Zafarraya basin (South of Spain). A 3D model for wave velocities inside the basin was achieved from the resonant frequencies of the H/V ratio jointly with the geologic information available by using a scheme of propagation of surface waves. The 3D model of the geometric and elastic properties, together with the digital model of the surrounding topography, was used as input data for the numerical computation of its seismic response. An explicit finite difference method in displacements was employed for such purpose. The synthetic seismograms show complex interference patterns in the interior of the basin. On the other hand, a great amount of diffracted waves generated in the mountains which surrounds the basin has been observed. Once these waves get into the sediments of the basin, produce an increase in both the amplitude and the duration of the signals in comparison with the case of considering a simple halfspace with flat free surface surrounding the basin (that is, a model of the basin without surrounding mountains).