environment. In this framework, we have simulated a small earthquake of magnitude 6.0 that occurred in the Marmara Sea and recorded at stations nearby. Observed waveforms are compared to synthetic seismograms computed with the frequency-wavenumber and wavenumber method and differences are interpreted. Additionally, strong ground motion recordings of the same earthquake are studied in order to form a basis for understanding wave propagation in small basins in metropolitan areas of Istanbul using 3D velocity model. In this content, we have investigated that if sediment-filled basins significantly amplify the wave amplitude and represented the requirement of the consideration of 3D propagation path and site effects.

SYMPHONY / COUPLING BETWEEN DISCRETE ELEMENT METHOD AND SPECTRAL FINITE ELEMENT METHOD. CONVENTIONAL AND NON-INFRARED TTLS

The code model [1] is initially a code of mechanics using the Discrete Element Method and taking into account nonlinear phenomena, such as the rupture under shock and impact. This approach can also be used in other areas, in particular in the seismic survey, but the consideration of non-linearity, (which entails an important calculation time) is not necessary generally during the treatment of the wave-propagation. So we have chosen to couple the Discrete Element Method with the Kernel code with a Spectral Element method [2]. This Spectral Element method is often used to simulate wave propagation and is less-expensive in terms of calculation.

For the first validations in 2D in the seismic domain, we have resumed the case studies of Lamb and Garvin, which are conventional ones often used to measure the precision of a numerical method on the elastic wave-propagation.

Non-linear tests have also been resumed with the Stress-3DTest located in the epicentral area of the 1910 Great Thessaloniki earthquake (Ic 6.5).

The valley lies between the Ieaf of volvi and Largada.

We present 2D calculations including realistic geometry and meeplocic layers and also signals at different amplitudes allowing to model ehlith linear effects.


SYMPHONY - HVR METHOD SENSITIVITY INVESTIGATION FOR THE CORIOSS ARRAY IN THE CORINTH GULF (GREECE)

SYMPHONY - HVR METHOD SENSITIVITY INVESTIGATION FOR THE CORIOSS ARRAY IN THE CORINTH GULF (GREECE)

The evaluation of local site effects on seismic ground motion is of great importance in earthquake engineering. With the construction of borehole stations, several investigations and objective functions have been developed in order to determine the shear wave velocity and the damping factors from available data. Using a genetic algorithm technique to invert the problems, this paper compares the use of frequency and time domain objective functions to evaluate the "distance" between observation and theoretical common objective function and the computation of the integrated residual between an observed spectral ratio taken on the 5-wave seismic array and the one computed theoretically. The performance of this process is the objective function itself, but the use of a cosine tapered window to smooth to zero both ends of the seismogram in order to compute the Peak Transfer Function. This paper shows that the length of the window slightly affects the location of the resonant peaks along the frequency axis, and can greatly affect the height of the peaks and consequently can skew the inversion of the shear wave velocity or damping factors. An alternative to this process has been introduced where the objective function is defined as the normalized cross-correlation between observed data and synthetic predictions previously decomposed in the wavelet domain. This process has been proven to perform well; however, the cross-correlation and the wavelet decomposition might lead to an increased computation time of the inversion. Consequently, this paper introduces a simple time domain objective function and shows numerical results obtained with the common frequency domain objective function.

SYMPHONY - DIFFERENCES BETWEEN ANALYTICALLY DEFINED ACCELERATION RESPONSE SPECTRA AND DESIGN SPECTRA INFERRED FROM THE ISRAELI SEISMIC CODE

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Seismic wave amplification in soft deposits has contributed to damage and loss of life in a number of earthquakes in the recent past. The resonant periods of urban structures are often close to those of the soft layers upon which many towns are built. Thus, reliable assessment of the frequency dependent site amplification effect is very important for safe design of buildings. In most national Building Codes, including the recently updated Israeli Standard (S 431), amplification factors: short period and long period. P ground motion are defined as a function of the site class which is based solely on geotechnical parameters of the upper 30 m of the soil profile, as quantified by the average shear wave velocity $v_{sw}$.

Over the years, we have conducted site investigations in thousands of sites across Israel, including more than 30 towns. These investigations demonstrated the usefulness of using the horizontal-to-vertical (H/V) spectral ratios from ambient noise measurements to identify sites with high amplification effects and to determine their resonance frequencies. Sites exhibited a peak appearing between 0.06 and 0.25 Hz. This phenomenon is known as the "click-through frequency" and it is associated with two resonance layers formed by high seismic impedance. This empirical information is correlated with both geotechnical and geophysical data to construct...