

DETERMINATION OF K VALUE AND ITS CORRELATION WITH VS30, BASED ON STRONG MOTION RECORDS OF THE ATHENS SEPTEMBER 1999 EARTHQUAKE

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In the present study, using strong motion data recorded after the strong ($M=5.9$) earthquake in Athens on September 7, 1999, the spectral decay parameters, k and k_0 , (Anderson and Hough, 1984) are determined. The results show that the attenuation in the area of Athens is less compared with mean of the Greek area. The value of the parameter k_0 was found equal to 0.035 (+0.009) and 0.049 (+0.008) msec/km for the soils of type B and C respectively according to NEHRP (1997) classification. The plot of the parameter k as a function of the frequency f_{95} shows a dependence on the depth of the recording station. The resulted values are related to the shear wave velocity of the shallow layer, VS30, for the geotechnical classification of the examined sites. Furthermore an attempt is made to investigate the influence of the spectral parameters and the VS30 values for various soil categories on the spectral shapes. Finally an application of these values is made for the simulation of the strong ground motion in four different sites. The comparison between the predicted and observed spectra shows a good agreement in the frequency range 0.2-20 Hz.