

V CONCLUSIONS

We presented several regression equations for modelling the duration of strong ground motion in the territory of former Yugoslavia using models developed earlier for the Western United States (the territory of the data was collected primarily in California). Two types of models were considered, with the magnitude or the intensity being the main scaling parameters. Without previous experience with the models for California, the development of the "magnitude type" regression equations for Yugoslavia would be difficult, and of the "intensity type" models would be virtually impossible.

The coefficients resulting from the regression analysis are slightly different for Yugoslavia than for the Western U.S. The main results of the comparison of the duration in the two regions are as follows. As a function of the earthquake magnitude, the duration increases faster (at frequencies higher than 5 Hz and for $M > 4 \div 5$) in Yugoslavia than in the Western U.S. The characteristic time of the rupture process in the source as a function of magnitude, estimated using a nonlinear model of the duration of strong motion, is longer in Yugoslavia than in California.

In both regions, the duration is an (approximately linearly) increasing function of the epicentral distance. The coefficient of proportionality (of the duration to the epicentral distance) is substantially smaller in Yugoslavia for all frequencies. This supports the assumption of higher wave velocities in sediments and weaker attenuation and scattering of the seismic waves in this region. In both regions, the duration of strong motion is longer at the sites located on sediments, than at the sites located on basement rock. This tendency can be observed in the frequency range from 0.5 to 5 Hz. However, the increase of duration on sediments is slightly higher in Yugoslavia than in California. This may be another indication of higher quality factor Q in Yugoslavia.

A different intensity scale is used in the Western U.S. (the Modified Mercalli Intensity scale) than in Yugoslavia (mainly the Mercalli-Cancani-Sieberg scale). After correction for the differences between the scales, the faster increase of the duration with an increase of the intensity in Yugoslavia can be noticed at frequencies higher than 2 Hz. At lower frequencies, the duration is a decreasing function of the intensity in both regions.

An increase of the database, especially of the number of records from large earthquakes and of the number of stations located on solid basement rocks (on geological scale) and on soft deep soils (on local scale) will allow one to develop more detailed and more consistent regression models for the prediction of strong motion duration in former Yugoslavia.