



## Site-specific analysis in Romania using small Vrancea earthquakes

**B. Grecu** (1), V. Sokolov (2), K-P. Bonjer (2), M. Popa (1) and M. Radulian (1)

(1) National Institute for Earth Physics, Bucharest-Magurele, Romania, (2) Geophysical Institute of Karlsruhe University, Karlsruhe, Germany, (bgrecu@infp.ro / Fax: +40 21 4930053)

The effect of local site conditions on the amplification of ground motions has long been recognized. The purpose of our study is to investigate the frequency-dependent amplification for more than 50 sites in Romania using records from small Vrancea earthquakes ( $M$  3.5-4.4) occurred during the CALIXTO '99 tomography experiment. Vrancea is a particular seismic region situated at the SE-Carpathians bend and is characterized by a high rate of occurrence of large earthquakes in a narrow focal volume. The local soil conditions in the considered sites vary from metamorphic rock to thick and water-saturated sedimentary formation. The characteristics of the ground motion amplification were evaluated using two different techniques. The first one, introduced by Sokolov (1998), consists in calculating ratios between spectra of actual earthquake records (horizontal components) and those modelled for a hypothetical "very hard rock" (VHR) site. The VHR spectral model was created using the Vrancea earthquakes ground-motion database. The second one, called Joint Source-Site Determination, is a site-reference technique which was introduced and described by Oncescu et al. (1994) based on the work of Andrews (1984). As a reference site we chose a site in Bucharest for which the geotechnical information is very well known from borehole data. The results of the study supplement the similar analysis performed using the permanent seismic network (K2-stations) and allow assessing advantages of the methods and provide a basis for site-dependent seismic hazard analysis in terms of engineering ground motion parameters for the territory of Romania. This study was carried out in the framework of Collaborative Research Centre (Sonderforschungsbereich) 461 "Strong Earthquakes: a Challenge for Geosciences and Civil Engineering".