



Site effect assessment: A few important challenges for European scientists

P.-Y. Bard

Laboratoire de Géophysique Interne et Tectonophysique, Observatoire de Grenoble, Grenoble, France (bard@obs.ujf-grenoble.fr / fax +33 476 828 101)

The tsunami hazard certainly deserves more consideration than in the past decade; however, the next earthquakes will probably call our attention back on the destructive effects of ground motion, within which site conditions play an important role. While USA, Mexico and above all Japan have launched huge programs to better understand and assess these effects, European efforts in this field remain very modest. Though, we are faced with a number of challenging scientific and engineering issues, that will be briefly overviewed, such as soil non-linearities, 2D-3D effects in small-size valleys and basins, surface topography effects, stability with respect to source characteristics, dynamic triggering of landslides, spatial variability over short distances, possible anthropic modifications in urbanized areas, site survey techniques and site categorization. While improvements in modelling capacities (software and hardware) are welcome, jumps in instrumental capacities are needed, including many rock/soil pairs of permanent sensitive strong motion stations throughout Europe to carefully record and document all kinds of non-linear effects, and several permanent and mobile dense arrays to improve our knowledge of the seismic wavefield for various geological configurations. Moreover, one of the top priorities should be to improve the discussion with the geotechnical and structural engineering communities, which implies thorough investigations on a) the non-linear behavior of soft and stiff soils, b) a reliable site characterization for all European strong motion sites, and c) simple but physically sound engineering models. Illustrations will be given only on a few examples, in order to raise the interest of European scientists, and prepare in-depth and active contributions for the next international symposium on Effects of Surface Geology.