EGS

Nice, France, 22-26 Apr. 2002

Paula Teves-Costa and all.

MICROTREMOR SURVEY ON POVOAÇÃO COUNTY (S. MIGUEL ISLAND, AZORES): DATA ANALYSIS AND INTERPRETATION

P. Teves-Costa (1), C. Riedel (2,3), D. Vales (4), N. Wallenstein (2), A. Borges (1,5), M.L. Senos (4), J.L. Gaspar (2), G. Queiroz (2)

(1) Centro de Geofísica da Universidade de Lisboa e DF-FCUL, Campo Grande, Edifício C8, 1749-016 Lisboa, Portugal, ptcosta@fc.ul.pt, (2) Centro de Vulcanologia e Avaliação de Riscos Geológicos, Universidade dos Açores, Ponta Delgada, Portugal, (3) Institut für Geowissenschaften, Kiel, Germany, (4) Instituto de Meteorologia, Lisboa, Portugal, (5) Instituto de Ciências da Terra e do Espaço, Lisboa, Portugal.

The seismic activity of the Azores Islands is known since the beginning of their settlement in the middle of the XV century. About 30 earthquakes produced social and economical important damages. The analysis of the damage distribution, for several earthquakes, shows systematically the existence of site effects. In order to understand the initial cause of these effects, three different zones were selected, with different geological and geomorphological characteristics, in the Povoação County, to perform a microtremor survey. Seismic data were recorded on a grid of 50 m in the three regions, using a 3-component Lennartz 1 Hz seismometer, with a sampling rate of 8 ms. The stations were deployed for 5 minutes or more to record microtremor imposed on the topmost layers by natural and anthropogenic sources. The data were processed using two different subroutine packages, in order to estimate the H/V ratio, defined according to the Nakamura methodology. However, the two processing routines gave different results, which forced us to revise all the procedures and to identify the main factors that caused it. Three portable seismic stations were installed in three fixed points, for about three months, aiming to record some earthquakes. Several small magnitude earthquakes ($m < 3.0$) were recorded and these data were processed in the same way as the noise data, obtaining reference H/V ratios. The interpretation of the dominant frequencies, for noise and small magnitude earthquakes, was performed taking into consideration not only the geological characteristics, but also the structural geomorphology.