



Array analyses of seismic activity during May 2004 at Teide Volcano, Canary Islands, Spain

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An increasing level of seismic activity has been detected at Teide Volcano, Canary Islands, during 2004. This activity is mostly composed of small-magnitude volcano-tectonic (VT) earthquakes, some of them felt at nearby populations. A low-amplitude tremor has been also identified with frequencies between 1 and 5 Hz. We analyze these data for a sample period in May 2004, using two seismic arrays located at Las Cañadas caldera, some 10 km east and southwest of Teide, respectively. We applied a cross-correlation technique to estimate the apparent slowness vectors in different frequency bands. We used this back-azimuth and apparent velocity information both to locate the source of the VT earthquakes using an approximate velocity model for the area and to determine the propagation characteristics of the recorded tremor wavefields. The results of the VT source location procedure indicate that most earthquakes originate within the volcanic edifice, just a few kilometers north and northwest of the Teide summit. These results are consistent with the locations provided by the IGN seismic network. The study of the recorded tremor constitutes a challenge for the seismic antennas, given the very low amplitude of the signal. A diurnal modulation of the tremor correlation is clearly observable. We attribute this effect to the high level of anthropogenic noise during the day hours. During the night, our analyses are able to reveal the presence of several coherent components with different propagation parameters. Some of them could be associated with the area of VT earthquake generation, while others suggest a relationship with different structural features of the Teide - Pico Viejo volcanic system.