Tomographic images of Teide Volcano

Jesus Ibanez

Istituto Andaluz de Geofisica, Università di Granada

In the present talk we will present the most recent results obtained in the study of active volcanoes. In particular we will present the tomographic images obtained in three active regions and some results derived form them. In the second part we will show some results obtained in the analysis of the explosive signals generated by the Colima volcano in Mexico.

Recently we have performed the high definition seismic tomography of three active regions around the word, Sao Miguel Island (Azores), Deception Island (Antarctica) and Tenerife Island (Spain). In Sao Miguel Island we related the velocity anomalies obtained in a passive experiment with the presence of geothermal fields and fault fields present in the region. The images of Deception and Tenerife Islands were obtained by using data derived from both seismic active experiments deploying a large number of seismic stations and performing thousand of seismic signals. In Deception Island we can identify a high contrast of velocity related to the regional tectonic regime and the possible presence of a magmatic chamber in surface that could be the responsible of a big future eruption. Recently we have obtained a high definition seismic tomography of Tenerife Island. These results are the first image of the inner part of this volcanic island with high level of volcanic risk. We will discuss the results as a function of volcano dynamics and eruptive episodes.

In the second part of the talk we will show some of the most recent results derived from the analysis of the seismic signal originated by volcanic explosions of Volcano de Fuego de Colima. We recorded these signals using seismic array and broad band seismometers. We have combined the information obtained in short and long period and invert all of them to locate the position of the initial source that triggers the explosions. We have related the mechanism of these explosions with the presence of an aquifer below the volcano that could have conditioned the volcano dynamics of the region.