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Introduction

In a society such as today's, which at least purports to be a welfare society, one of the priorities of research should be to study all the aspects related with natural hazards, in particular those of geological origin, in an endeavour to reduce the vulnerability associated to them and therefore improve the quality of life. Two of the natural hazards of geological origin that cause the greatest impact and pose the biggest risk to society are volcanic and seismic activity. Consequently, any advances in ascertaining the different physical processes linked to the several stages associated to these phenomena are highly important and clearly apply in day-to-day monitoring techniques. The final implication of any method capable of detecting and even predicting natural hazard precursory phenomena is that it could help to prevent the damage to people and properties that such events could produce. Achieving this goal, which obviously has clear economic advantages, involves ascertaining every possible aspect of precursory phenomena (zone dependency, estimated size, etc.). The experimental and theoretical aspects to this task are highly complex, and must be combined if the best possible research results are to be attained. Volcanic and seismic hazards are very hard to predict, and though in recent years significant progress has been made with current monitoring systems, much remains to be done before such phenomena can be detected accurately. Both kind of phenomena produce effects before, during, and after the activity, and even between events. On the basis of this fact and the high levels of precision attainable, many geophysical and geodetic techniques have proved to be necessary and powerful tools in the monitoring of volcanic and seismic activity. Applying such techniques to routine monitoring of active zones inevitably involves data processing and the subsequent final interpretation of observed record. The advent of new space-based geodetic techniques such as SAR Interferometry (InSAR), or the use of actual seismic broadband data have provided a very powerful and reasonably source of information for gaining in-depth knowledge of these phenomena. However, more

sophisticated and realistic mathematical models, and also modern techniques for solving the inverse problem, are required to understand the new and more complex records.

It was in this framework that the International Complutense Seminar (Seminario Intenacional Complutense) "*Geodetic and geophysical effects associated to seismic and volcanic hazards. Theory and observation*." was organised and held at the School of Mathematical Sciences of Universidad Complutense de Madrid, from 8 to 11, October 2001. Several of the papers given at this International Seminar, and others that are clearly related to the subject, are now published in this Volume 14 of Física de la Tierra, entitled "Geodetic and geophysical techniques, models and applications". This volume addresses all of these aspects, which range from theoretical modelling, space and terrestrial geodetic techniques, design of geodetic monitoring and geophysical and seismological techniques.

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José Fernández (Consejo Superior de Investigaciones Científicas)
Francisco Luzón (Universidad de Almería)