Geophysical Research Abstracts
Vol. 16, EGU2014-8855-1, 2014
EGU General Assembly 2014

Identification of a potential monogenetic volcano using seismology

Denis LEGRAND (1), Klaus Bataille (2), Jose Cembrano (3), Andres Pavez (4), Kundu Bashkar (5), Vineet Gahalaut (5), and Raul Perez (6)

(1) Instituto de Geofisica, Departamento de Vulcanologia, UNAM, Mexico, (2) Universidad de Concepcion, Facultad de Ciencias Quimicas, Departamento de Ciencias de la Tierra, Concepcion, Chile, (3) Pontificia Universidad Catolica de Chile, Departamento de Ingenieria Estructural y Geotecnica, Vicuna Mackenna 4860, Santiago, Chile, (4) Universidad de Chile, Departamento de Geofisica, Blanco Encalada 2002,Santiago,Chile, (5) National Geophysical Research Institute, Hyderabad, India, (6) IGME-Instituto Geológico y Minero de España, Departamento de Investigación y Prospectiva Geocientífica, Área de Riesgos Geológicos, C/ Alenza, n° 1, 28003, Madrid, Spain

Some monogenetic volcano fields are very close to cities, such as in New Zealand or in México. A new monogenetic volcano may appear at any place and at any time, which could be potentially hazardous for nearby regions. The ability to detect a new one in advance is obviously very important and challenging. The existence of nearby seismometers may help for such detection. Magma sometimes reaches the surface with the birth of a volcano which can be monogenetic, but in other cases the magma does not reach the surface How to detect such movements? How to be sure the magma will reach the surface? Some observations may detect them, such as seismicity which is distributed as a swarm, with a very peculiar distribution in time and magnitudes. In particular, it is important to distinguish between a tectonic swarm and a volcanic swarm. Scaling laws of seismicity in magnitude and time help to perform such a distinction. We show three cases: a seismic swarm in Chile, in the 2007 Aysen crisis, corresponding to an aborted birth of a monogenetic volcano; a seismic swarm triggered after the 2004 great Mw$\sim$9.2 Sumatra-Andaman earthquake over an old monogenetic volcano; and a spatial study of monogenetic volcanoes in Mexico (Michoacán) showing the difficulty to forecast the place and time of the birth of a monogenetic cone without seismological records.