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Seismic Interferometry applied to fracture seismicity recorded at Planchón-Peteroa Volcanic Complex, Argentina-Chile

Casas J. A.[1,2], Draganov D.[3], Olivera Craig V. H.[1], Manassero M. C.[1], Badi G. A.[1], Franco Marín L.[4], Gomez M.[5], Ruigrok E.[6]

[1]*Facultad de Ciencias Astronómicas y Geofísicas, Universidad Nacional de La Plata, ARGENTINA*
[2]*Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), ARGENTINA*
[3]*Department of Geoscience and Engineering, Delft University of Technology, THE NETHERLANDS*
[4]*Observatorio Volcanológico de los Andes del Sur (OVDAS-SERNAGEOMIN), Chile.*
[5]*ICES, CNEA, ARGENTINA*
[6]*Department of Earth Sciences, Utrecht University, THE NETHERLANDS*

e-mail: acasas@fcaglp.unlp.edu.ar

Seismic interferometry (SI) studies the interference phenomenon between pairs of signals in order to obtain information from the differences between them. SI is now regularly used in exploration and global seismology with active and/or passive sources, i.e., artificial sources (dynamite, vibroseis, sledge hammer, etc.) or natural sources (earthquakes, anthropogenic noise, ocean microseisms, etc.). SI allows one to extract subsurface information from complicated or random wavefields.

This research aims to contribute to the knowledge of the subsurface structure at Planchón-Peteroa Volcano Complex (PPVC) by using SI technique. Inspired by the theory and applications in Wapenaar (2003) and Ruigrok and Wapenaar (2012), this work applies SI to fracture seismicity originated at PPVC or in active geologic faults located nearby this volcanic complex. Applying autocorrelation to a selected time window at each event, zero-offset reflection responses were obtained for each station. This response can be used to determine the location of shallow subsurface reflectors underneath each station.

This application uses seismic data recorded by stations deployed in Argentina and Chile. The Argentine data was recorded by an array of six 2-Hz 3-component stations on the eastern flank of the volcano, deployed during the MalARRgue project in 2012. The Chile data is provided by OVDAS-SERNAGEOMIN (South Andes Volcanic Observatory, Chile). OVDAS has six 3-component 30-seconds stations located on the western flank of the volcano; these stations overlap in the same time period as the Argentine data.

Events had been identified and located independently by the arrays deployed in each of the flanks *(Casas, 2014; RAV SERNAGEOMIN, 2012)*. In order to obtain accurate locations of the detected events, the two datasets were used together to relocate them. This result constitutes a necessity for enhancing the resolution of subsurface images obtained by application of SI at PPVC.

Preliminary results of this research will be presented.