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**TITLE:** The characterization of subsurface structures in the Malargüe region using seismic interferometry

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**ABSTRACT BODY:** The Malargüe region (Mendoza, Argentina) has an active, though little studied, tectonic setting at the east-side of the Andes. The main shaping force is the subduction of the Nazca Plate. The region is characterized in the West by the Principal Cordillera with silicic andesitic volcanoes, and in the East by a precordillera plateau with basaltic volcanos. One large concern for the local population is the Planchon Peteroa Volcano. Since the late 1990s, Peteroa has reactivated. Its latest activity was in 2010, when it released fumes. Therefore, a seismic array could play an important role in hazard assessment. Besides, having an intriguing subsurface with abundant seismicity, the Malargüe region is well situated for studying seismic noise sources in the South Pacific.
In the beginning of 2012, a large temporary seismic array was installed in the Malargüe region. This PASSCAL (Program for Array Seismic Studies of the Continental Lithosphere) array was employed until the end of 2012 and consisted of 38 seismic stations. The stations are divided in two subarrays: a so-called P array located on the flanks of the Peteroa volcano, and a so-called T array spread out on a plateau just east of the town of Malargüe. The array was installed with the purpose of imaging and monitoring the subsurface below the Malargüe region. The imaging targets, like the Moho and the Nazca slab, are relatively deep. Yet, the array has dense station spacing, allowing exploration type processing. For high resolution imaging, also dense source spacing is required. Such sources will be facilitated, not by employing actual sources, but by creating virtual sources with seismic interferometry (SI). With this seismic technique, observations from distant sources can be remapped to responses from virtual sources at receiver locations. When SI is applied for a regularly spaced array of receivers, uncontrolled natural sources can be turned into a well organized succession of virtual sources. With a well sampled array of virtual sources and receivers available, a detailed reflectivity image of the Earth's crust (using body waves) and a detailed velocity model (using surface wave inversion) could be obtained.
Focusing on the P array, the goal is to image the structure of part of the Peteroa volcano. This is done using SI, and applying this technique to ambient seismic noise. By means of crosscorrelation analysis between all the stations, it is possible to retrieve surface waves. Successively, surface-wave tomography will be applied, in order to obtain a velocity model suitable for the interpretation of the subsurface structures. Focusing on the T array, the characterization of the subsurface structures below the plateau, such as the Nazca slab subduction, as well as the Moho discontinuity, will be attempted using SI applied to teleseismic body-wave reverberations. In this presentation, preliminary results for both the surface-wave and body-wave SI will be shown.

**KEYWORDS:** 7200 SEISMOLOGY, 7203 SEISMOLOGY Body waves, 7270 SEISMOLOGY Tomography, 7215 SEISMOLOGY Earthquake source observations.

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## Additional Details

**Previously Presented Material:**

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