

## Tomography of Mejillones Peninsula using cross-correlation of ambient seismic noise

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The Mejillones Peninsula (MP) is located in northern Chile (-23.28°, -70.5°). MP is a geomorphic atypical uplifted block of the coastal platform of 100 km length. This structure has been proposed as a segment boundary for large subduction earthquakes, as the case of Mw 8.0 Antofagasta (1995) and Mw 7.7 Tocopilla (2007) events. Additionally, the Peninsula presents a wide and deep layer of sediments that could enhance site effects. For this reason, in this work we study the shallow structure of MP basin. We deployed a dense temporary seismic network in the MP, which registered in continuous time from July 2013 to September 2015. From the continuous records, we built a local tomography using the spectral ambient seismic noise. We use vertical component of seismograms to obtain the Green function from cross-correlation between station pairs. The frequency domain method allows determine of phase velocity relating the zero-crossing of the real part of cross-correlation spectrum with the zero crossing of the zero-order Bessel function of the first order. The Rayleigh wave phase velocities are inverted by means of a non-linear iterative 2-D tomographic technique; finally we recover phase velocity maps at different frequencies. The tomographic maps present significant features that correlate with surface geology. We found in the West part of the MP lower velocities than East zone. We can associate this with fractured metamorphic rock. Higher velocities in the Eastern part of the peninsula are associated with the presence of intrusive rocks. The difference in velocity of these two anomalies is maintained at different depths.

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