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Upper crustal velocity structure beneath Northern Peruvian Andes from ambient noise tomography

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The structure of the crust in the northern region of Peru is a consequence of the convergence between the oceanic Nazca plate and the South American continent. Several studies have aimed to understand the structure and dynamics of the Peruvian crust. Despite this effort, many aspects remain poorly understood. In this study, we applied the technique of ambient noise seismic tomography (ANT) with the objective of studying the shear-wave crustal velocity structures in northern Peru. We use cross-correlations of ambient seismic noise at 26 broadband stations from national and international networks in northern Peru to image the crustal structure. Empirical Green's functions were obtained after the frequency-domain normalization of the ambient noise recordings and stacking of 24 months of normalized data. Dispersion curves from phase velocity maps were inverted as a function of depth to obtain 3D shear wave velocity model of the upper crust. The preliminary results reveal features that correlate with surface geology. We observed a slow velocity zone at a depth of 25-35 km, under the Sub-Andes that may represent regions with major deformation caused bythe isostatic compensation that correlates with the seismicity, crustal thickness model and Bouguer gravity values.