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## Using ambient noise tomography to image tectonic and magmatic features of the Irazú-Turrialba volcanic complex at regional and local scales

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Passive seismology in volcanically active locations provides a valuable insight into the structural and evolutionary characteristics of subsurface magmatic features. The Irazú-Turrialba Volcanic Complex (ITVC) consists of a twin-system of volcanoes in Costa Rica, located at the south-eastern end of the Central American Volcanic Arc (CAVA). The ITVC represents a noticeable delineation of this subduction arc sequence, influenced by the formation of the Panama microplate and potentially driven by the Central Costa Rican Deformation belt (CCRDB). This volcanic arc is formed by the subduction of the Cocos Plate, beneath the Caribbean plate. This is an interesting twin-volcanic system consisting of the close-system of Irazú, and actively-venting open-system of Turrialba. Utilizing ambient noise tomography (ANT), 3D shear-wave velocity models are retrieved and compared to previously determined major tectonic features at both regional and local scales

Data were collected from 20 temporary broadband seismic stations, forming a network around the ITVC, and supplemented by 45 permanent stations from the regional networks (OVSICORI & RSN). We used the continuous noise readings from vertical components to compute cross-correlation functions. We then used Rayleigh wave group-velocity dispersion curves to perform an inversion to obtain 2D group velocity maps at both regional and local scales. A further inversion step was undertaken to obtain 3D shear-wave velocity models of the regional features of the Central American Volcanic Arc and more local-scale features of the plumbing system beneath the ITVC. Features determined in the inversions are compared to the literature-established, large-scale and local tectonic features, creating an image of the twin-system complex. In particular, we compare the subsurface magmatic features of the ITVC to establish the impact of local and regional faulting on the shape of the internal plumbing structure, and to determine whether ANT can effectively constrain these known tectonic features.

We establish an improved understanding of the ITVC whole-system plumbing, and the regional velocity anomalies attributed to other Costa Rican volcanic systems within the Central American Volcanic Arc and relation to the tectonics.