ID: **P1.2-346** Type: **E-poster**

Crust-Uppermost Mantle Structure Beneath the Caribbean Region from Seismic Ambient Noise Tomography

Tuesday, June 20, 2023 11:23 AM (1 minute)

We present a new 3-D shear velocity model for the crust-uppermost mantle structure beneath the Caribbean region from the surface down to 150 km depth. Our velocity model was derived from joint inversion of group and phase velocity dispersion data obtained from ambient noise and earthquake data. The group and phase dispersion curves estimated from ambient noise were calculated from cross-correlation using up to four years of continuous data. Perturbations in group and phase surfaces wave velocities within a resolution of 1x1 degrees show the relevant geotectonic units in the Caribbean plate. Plate boundaries, ocean basins, rises, rifts and microplates are well defined by shear wave velocity impedances. The 3-D shear wave velocity inversion along profiles shows the thickening of the crust from the ocean to continental margins. We present a new Moho interface map with depths undulating between 11 km and 17 km beneath most parts of the sea and 25 km to 45 km below the continental areas. Low velocity zones were found in the uppermost mantle indicating a highly laterally heterogeneous area.

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Promotional text

We provide a new crust-uppermost shear wave velocity model with implications on the geodynamics in the Caribbean. The Moho map reveals a complex crust structure within a heterogeneous lithosphere-asthenosphere system.

Oral preference format

in-person

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Session Classification: Lightning talks: P1.2-2

Track Classification: Theme 1. The Earth as a Complex System: T1.2 The Solid Earth and its Structure