

INVESTIGATION OF THE EXTENT OF THE CARIBBEAN SLAB

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The Caribbean is a complex tectonic area including plenty seismic activity and volcanoes and scientists are investigating different features of this region for long time. Magnetic anomalies are absent at plate boundaries of the Caribbean and some of its neighbour plates wherefore it is still unclear how the Caribbean plate formed. Thus, the dimension of the different subduction zones within this area is further debated.

This study investigates the shape and the extend of the different plates subducting in the Caribbean by PP- and SS-wave underside reflections off the 410 km and 660 km phase transitions in the Earth's mantle. Travel times between the main reflection phases (PP/SS) and their precursors ($P^{410}P$, $P^{660}P$, $S^{410}S$, $S^{660}S$) are measured and converted in reflection depths. These values can be interpreted in terms of temperature and composition of the mantle and provide insights into the subduction extend. Within the time period from 2000 to 2018, 20 events with a magnitude $M_w \geq 5.9$ were analysed, showing high quality PP and SS precursor signals recorded in an epicentral distance range of $80^\circ - 160^\circ$. The dataset consists of 82 reflections underneath the Caribbean which densely cover the area of interest by crossing ray paths.

Convergent plate boundaries at subduction zones release the vast amount of seismic energy worldwide. We aim to constrain high-resolution dynamic rupture simulations of the Caribbean region using the ascete framework. To this end we include topography, 3D geological structures, rheology, and fault geometries for earthquake scenarios which can inform tsunami modelling.

