



From transpressional to transtensional tectonics in Northern Central America controlled by Cocos – Caribbean subduction coupling change

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The Central American Volcanic Arc (CAVA) is located at the western margin of the Caribbean plate, over the Chortís Block, spanning from Guatemala to Costa Rica. The CAVA is associated to the subduction of the Cocos plate under the Caribbean plate at the Middle America Trench. Our study is focused in the Salvadorian CAVA segment, which is tectonically characterized by the presence of the El Salvador Fault Zone (ESFZ), part of the western boundary of a major block forming the Caribbean plate (the Chortis Block). The structural evolution of the western boundary of the Chortis Block, particularly in the CAVA crossing El Salvador remains unknown. We have done a kinematic analysis from seismic and fault slip data and combined our results with a review of regional previous studies. This approach allowed us to constrain the tectonic evolution and the forces that control the deformation in northern Central America. Along the active volcanic arc we identified active transtensional deformation. On the other hand, we have identified two deformation phases in the back arc region: A first one of transpressional wrenching close to simple shearing (Miocene); and a second one characterized by almost E-W extension. Our results reveal a change from transpressional to transtensional shearing coeval with a migration of the volcanism towards the trench in Late Miocene times. This strain change could be related with a coupled to decoupled transition on the Cocos – Caribbean subduction interface, which could be related to a slab roll-back of the Cocos Plate beneath the Chortis Block. The combination of different degrees of coupling on the subduction interface, together with a constant relative eastward drift of the Caribbean Plate, control the deformation style along the western boundary of the Chortis Block.