Geophysical Research Abstracts
Vol. 16, EGU2014-5935, 2014
EGU General Assembly 2014

Linking the Galapagos hotspot and the Caribbean Plateau

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Wide agreement exists that the Caribbean plate has a Pacific origin and that parts of it depict an igneous Plateau of up to 20 km thick crust. However, the origin of this thickened crust remains debated. One of the first suggestions for its origin was the arrival of a plume, whose remnant might be the Galapagos hotspot. More recently, it has been argued that reconstruction models predicted the Galapagos hotspot a thousand or more kilometres away from the Caribbean plate at the time of Plateau formation (∼88 ?? 94 Ma). These authors primarily relied on the Caribbean Plateau moving into its present position relative to the Americas only in the last few million years. Secondarily, the authors assumed that the hotspot was fixed in an Indian-Atlantic hotspot reference frame. Here, we explore the idea that the Plateau moved into position around the time of the initiation of convergence between the North and South America, about 54.5 Ma. In addition, we adopt a fixed Pacific hotspot reference frame and compare our results to the recently developed Global Moving Hotspot Reference Frame. We show that both frames lead to good correlations between the paleo-positions of the Caribbean Plate and the Galapagos hotspot. As this result is consistent with abundant geochemical evidence that lends support for both a plume origin as well as the similarity between the Galapagos hotspot and rocks from the Plateau itself, we argue that alternative mechanisms to explain the thickened crust of the Caribbean Plateau are unnecessary. Additionally, based on our new plate reconstruction model, we present an age distribution of the lithosphere underneath the thickened crust of the Caribbean Plateau that has remained speculative until now.