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The kinematic evolution of the Demerara plateau and Guyana-Suriname margins

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The Caribbean region has undergone a complex plate kinematics evolution due to the interaction between Central Atlantic pre-subduction paleogeography and Caribbean subduction dynamics. To better understand the initiation and dynamics of the Caribbean subduction it is important to determine the pre-subduction template. However, this template cannot be easily recognized as it either suffered from pervasive tectonic overprinting or has been consumed by subduction. To address this problem, it may be valuable to first unravel the structure and deformation history of the surrounding areas of the Caribbean region.

Here we investigate the kinematic evolution of the Triassic-Jurassic Demerara plateau and Guyana-Suriname (i.e Dp and G-S) margins which are present-day located to the south of the Caribbean subduction. To achieve our aim, we use seismic, gravity and magnetic data and apply a gravity anomaly inversion technique to determine Moho depth, crustal basement thickness and crustal thinning factor.

The Dp and G-S margins avoided subduction and consequently preserve the divergent history of Early Jurassic to Early Cretaceous rifting related to the opening of the Central Atlantic and Equatorial Atlantic respectively. This is inferred by a complex architecture of the Dp and G-S margins characterized by a set of transfer zones that crosscut each other.

By unravelling the kinematic evolution of the Dp and G-S margins we attempt to determine the pre-subduction template of the surrounding area of the Caribbean region.