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# Paleomagnetic rotations in the north eastern Caribbean region reveal major intraplate deformation since the Eocene

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## Résumé

Relative Caribbean-North American plate motion is partitioned over the trench and intra-Caribbean plate faults that bound large scale tectonic blocks. Quantifying the kinematic evolution of this tectonic corridor is challenging because much of the region is submarine. We present an extensive regional paleomagnetic dataset (1330 cores from 136 sampling locations) from Eocene and younger rocks of the northern Lesser Antilles, the Virgin Islands, and Puerto Rico, and use a statistical bootstrapping approach to quantify vertical axis block rotations. Our results show that the Puerto Rico–Virgin Island (PRVI) block and the Northern Lesser Antilles (NoLA) block formed two coherently rotating domains that both underwent at least 45° counterclockwise rotation since the Eocene. The first ~20° occurred in tandem in late Eocene and Oligocene time, after which the blocks were separated in the Miocene by the opening of the Anegada Passage. The last 25° of rotation of the PRVI block ended in the middle Miocene, whereas the NoLA block rotated slower, until the latest Miocene. The boundary between the NoLA block and a non-rotated Southern Lesser Antilles was likely the Monserrat-Harvers fault zone. These results require hundreds of kilometers of intra-Caribbean motions with oroclinal bending of the trench or forearc sliver motion along the curved plate boundary as endmembers. These data invite a critical re-evaluation of the kinematic reconstruction of Caribbean-North American plate motion. The consequent changes in paleogeography may provide a new view on the enigmatic eastern Caribbean paleo-biogeography and the Paleogene dispersal of South American mammals toward the Greater Antilles.

**Mots-Clés:** Paleomagnetism, paleo, rotation, Caribbean plate, intraplate deformation.

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