

A review of strain partitioning in the Northern Lesser Antilles (Guadeloupe to Virgin Island).

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Along the convex Northern Lesser Antilles margin, plate convergence obliquity increases northward resulting in subduction normal to the trench to the west of Guadeloupe and highly oblique ($>75^\circ$) to the North of Virgin Island. In this context, tectonic structures related to strain partitioning has long been debated, but are still poorly imaged. In particular, it was proposed that ~800x300km Northern Lesser Antilles Forearc sliver, bounded by a lithospheric strike-slip fault in the volcanic arc moves independently northward as a block distinct from the Caribbean Plate. However, tectonic limits for this major sliver remain poorly imaged.

Geophysical data acquired during the ANTITHESES cruises, which aim at investigating tectonic deformation related to strain partitioning, depict a different pattern.

1- At the Southern limit of the Puerto-Rico – Virgin Island margin segment the ~400-km-long E-W trending left-lateral Anegada Passage strike slip system is likely to be related to strain partitioning, although lateral motion is very slow.

2- To the South, in the Northern Lesser Antilles margin segment, en-echelon short transtensional faults along the volcanic arc are interpreted as the expression of strain partitioning. This system differs from lithospheric scale, continuous strike-slip systems such as the Great Sumatran Fault, the Median Tectonic Line in Nankai and the Philippine fault. En-echelon systems are typical of early stages of strike-slip deformation before coalescing in mature strike-slip fault.

3- At the front of these margin segments, the ~850-km long sinistral strike-slip Bunce Fault extends to 18.5°N and develops along the mechanical discontinuity between the 20-30-km-wide sedimentary wedge and a more rigid backstop. This strike-slip system anastomoses southward within the accretionary prism where the sharp increase in convergence obliquity possibly acts as a mechanical threshold.

Thus, the absence of crustal-scale, long-term strike-slip tectonic system in the arc and the fore-arc, south of the Anegada Passage, casts doubts onto strain partitioning in the Northern Lesser Antilles forearc. Plate motion could be mostly unpartitioned south of the Anegada Passage or taken up along pervasive short systems in a more diffuse pattern at margin scale, possibly owing to low interplate friction or lesser obliquity.

Mots-Clés : Subduction zone, Tectonic deformation, Strain partitioning, Multichannel seismic data, Northern Lesser Antilles.