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Compressive tectonics recorded in the joint system of the St. Peter and St. Paul Archipelago, Equatorial Atlantic Ocean

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Recent studies of the deep-sea morphology of the St. Peter and St. Paul system in the Equatorial Atlantic Ocean reveal that its basement, the Atoba ridge (Fig. 1), is constituted by two elongated flanks, one submerged (South flank) and other emerged (North flank). The anomalous elevation of the entire tranverse ridge is due to a transpressive regime generated by the propagation of the MAR northern segment to the South[1,2]. In order to define the persistence and present-day state of this tectonic regime we studied the petrography and geometry of the joint-system exposed on the St. Peter and St. Paul archipelago (SPSPA), showing that a North-South shortening/transpressional uplift tectonism, is still active on the system. These islets are the summit of a sigmoidal ridge formed by extremely deformed ultramafic mantle rocks. The North flank is crossed by the principal deformation zone of the northern transform fault of the St. Paul multi-fault system[1]. The South flank exposes serpentinized mantle harzburgite, while the North flank exposes serpentinized and strongly deformed/fractured ultramylonitic mantle harzburgite, recording ductile and brittle deformation at lithospheric conditions[1,2]. The SPSPA shows multiple joint systems cutting the mylonitic foliation of the exposed ultramafics. They form three main families: high-angle parallel joints of tectonic origin, serpentinization-related joints with random direction and load-release low-angle parallel joints. The tectonic joints show an average direction of N31°E and N28°W, forming a conjugate system with a N1ºW compression axes, coherent with a transpressive stress field (Fig. 2). Accordingly, the focal mechanisms of the earthquakes close to the islets suggest a main N-S compression. We infer that a net uplift of 1.5 mm/year acted during the last 6,600 years[2], representing the last stage of a long-lasting (ca. 10 My)[1] and still active N-S local compressive field at a high angle with the direction of the transform fault