



Present-day stress field on the South American slab underneath the Sandwich Plate (Southern Atlantic Ocean)

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This work confirms the present-day principal stress orientation on the South Sandwich Plate (SSP) from the analysis of 331 earthquake focal mechanisms (Harvard catalog, HCMT). Principal stress orientation was deduced from earthquake focal mechanisms, examined by fault population analysis methods. The SSP plate is composed by oceanic crust limits an elliptical trench to the east (South Sandwich Trench), a ridge to the west and transforms faults towards the northern and southern boundaries. Within the trench region, the maximum horizontal shortening direction (SHMAX) rotates in trend in a clockwise direction, from NNE, in the northern boundary, to SSE in the southern boundary. Therefore, and keeping in mind the gradual rotation of SHMAX along the trench, three different areas were defined according to the prevailing focal mechanism type: (1) the North Zone, with SHMAX oriented N060°E and reverse and strike-slip focal mechanisms; (2) the Central Zone, with only reverse focal mechanism and SHMAX striking N080°E; (3) the South Zone, with SHMAX oriented N110°E and reverse and strike-slip focal geometry.

Furthermore, the accommodation of the strain field in the Northern Zone of the South Sandwich Plate generates a subduction decoupling of the slab at, approximately, 70 km depth. In contrast, the South Zone slab exhibits a gradual stress and strain magnitude decreasing in depth. Finally, we define a sinistral strike-slip parallel to the southern boundary between the South Sandwich Plate and the Antarctic Plate, the South Sandwich Fault Zone.