



Brazilian Proposal for a PIRATA SW Extension
Scientific Rationale

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Paulo Nobre¹ — CPTEC/INPE

Edmo Campos, Paulo S. Polito, Olga T. Sato —
IO/USP,

João A. Lorenzzetti — OBT/INPE

The PIRATA project is a three-party initiative involving Brazil, France, and the United States to assemble a pilot array of moored buoys to monitor the physical processes in the interface between the atmosphere and upper ocean over the tropical Atlantic.

The array was composed by 12 ATLAS systems during its pilot phase (1997-2000) and 10 systems during the consolidation phase of the project, which will last five years, ending in 2005/2006. Afterwards, the project will be evaluated to become a permanent contribution to the Global Ocean Observing System (GOOS).

During the establishment of the original PIRATA backbone it was anticipated that future regional extensions would be expected to further the scientific scope of the project and to improve the understanding and predictions of regional climates.

The scientific reasoning for the proposal of a PIRATA SWE lies on three main phenomena:

- (a) the coupled interactions between the SW Atlantic SST and the South Atlantic Convergence Zone (SACZ), for which there are both observational and modeling evidence of a strong SST-cloud-solar-radiation-SST coupling;
- (b) the formation of a Southern Intertropical Convergence Zone (SITCZ), which is linked with horizontal gradients of SST and wind divergence between the cold tongue area over the eastern equatorial Atlantic and the southwestern equatorial Atlantic at 8°S, 30°W; and
- (c) the advection of eddies by the South Equatorial Current (SEC) into the region of western boundary currents system formed by the Brazil Current (BC), the Northern Brazil Current (NBC), and the Equatorial Under Current (EUC).

The logistics to implement and operate the proposed PIRATA extension counts heavily on Brazilian resources and the time honored partnership with NOAA to build and maintain the necessary new ATLAS systems.

The establishment of the PIRATA SWE shall be a valuable contribution to understand not only the regional climate variability, but also its interconnections with the global climate.

Combined with other international research projects already taking place over the SW Atlantic, the proposed extension shall help to determine the partition of salt and heat that recirculates over the South Atlantic and that which is transported to the North Atlantic.