



Deep structure of the Santos Basin-São Paulo Plateau System, SE Brazil

Mikael Evain (1), Alexandra Afilhado (1,2,3), Caesar Rigoti (4), Afonso Loureiro (2), Daniela Alves (2), Frauke Klingelhoefer (1), Philippe Schnurle (1), Aurelie Feld (1), Reinhardt Fuck (5), Jose Soares (5), Marcus Vinicius de Lima (6), Carlos Corela (2), Luis Matias (2), Massinissa Benabdellouahed (1,7), Agnes Baltzer (1,8), Marina Rabineau (7), Adriano Viana (4), Maryline Moulin (1), and Daniel Aslanian (1)

(1) IFREMER, REM-GM-Laboratoire de Géodynamique et de Géophysique (LGG), Technopôle Brest-Iroise, CS 10070, 29280 Plouzane, France (mikael.evain@ifremer.fr), (2) Instituto Dom Luis (IDL), Faculdade de Ciências da Universidade de Lisboa, 1749-016 Lisboa, Portugal, (3) Instituto Superior de Engenharia de Lisboa (ISEL), Rue Conselheiro Emidio Navarro, 1959-007 Lisboa, Portugal, (4) PETROBRAS/CENPES-PROFEX, Rio de Janeiro, Brazil, (5) Lablithos, Instituto de Geociências (IG), Universidade de Brasília, Campus Darcy Ribeiro, 70910-900 Brasília, Brazil, (6) Universidade Federal do Pampa, Campus Caçapava do Sul, Caçapava do Sul, Brazil, (7) Institut universitaire européen de la mer (IUEM), Domaines Océaniques, CNRS, 29280 Plouzané, France, (8) LETG-Nantes Géolittomer, Université de Nantes, Campus Tertre, BP 81227 - 44312 Nantes, Cedex 3, France

The structure and nature of the crust underlying the Santos Basin-São Paulo Plateau System (SSPS), in the SE Brazilian margin, is discussed based on five wide-angle seismic profiles acquired during the SanBa experiment in 2011. Velocity models allow us to precisely divide the SSPS in six domains from unthinned continental crust (Domain CC) to normal oceanic crust (Domain OC). A seventh domain (Domain D), a triangular shape region in the SE of the SSPS, is discussed by [Klingelhoefer et al., GJI, 2014] [U+2060]. Beneath the continental shelf, a ~100 km wide necking zone (Domain N) is imaged where continental crust thins abruptly from ~40 km to less than 15 km. Toward the ocean, most of the SSPS (Domain A and C) shows velocity ranges, velocity gradients and a Moho interface characteristic of thinned continental crust. The central domain (Domain B) has, however, a very heterogeneous structure. While its southwestern part still exhibits extremely thinned (7 km) continental crust, its northeastern part depicts a 2-4 km thick upper layer (6.0-6.5 km/s) overlying an anomalous velocity layer (7.0-7.8 km/s) and no evidence of a Moho interface. This structure is interpreted as atypical oceanic crust, exhumed lower crust or upper continental crust intruded by mafic material, overlying either altered mantle in the first two cases or intruded lower continental crust in the last case. The v-shaped structuration in this central domain confirms an initial episode of rifting within the SSPS oblique to the general opening direction of the South Atlantic central segment.