

# **GEOID AND FREE-AIR ANOMALIES OF THE SOUTH ATLANTIC BETWEEN 65-25W AND 25-40S: DENSITY DISTRIBUTION AND THERMAL HISTORY OF THE LITHOSPHERE.**

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Geoid and free-air anomalies over the Uruguay/Rio-Grandense Shield, Pelotas Basin, Rio Grande Cone and Rio Grande Rise were obtained by integrating conventional gravity data and those derived from GEOSAT satellite altimetry using least-squares-collocation. Geoid highs are observed over the main tectonic features. Density distribution with depth indicates an important crustal thinning under the Uruguay/Rio-Grandense Shield and Pelotas Basin. This result integrated with a few fission-track ages of the onshore continental margin basement and with Pelotas basin stratigraphy suggest an uplift and erosion in this segment of the continental lithosphere as a result of a thermal anomaly which lasted until 30 Ma. The same thermal structure is observed in the Rio Grande Rise where the oceanic lithosphere is 80 Ma. As a result of the continental margin uplift and erosion large amounts of sediments were deposited offshore and in the Rio Grande Cone. Free-air anomaly data inversion provides a new isopach map of the sediments deposited over the oceanic lithosphere during the drifting stage of the South Atlantic, which have not been previously mapped.