

EGU24-22147, updated on 20 May 2024

<https://doi.org/10.5194/egusphere-egu24-22147>

EGU General Assembly 2024

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



Interpretation of a second-order discontinuity at 1°N latitude of the Mid-Atlantic Ridge

Raissa Francicleide Sousa da Silva^{1,2}, Helenice Vital^{1,2,3}, and Aderson Farias do Nascimento^{1,2,3}

¹Federal University of Rio Grande do Norte (UFRN), Brazil

²Postgraduate Program in Geodynamics and Geophysics (PPGG), Brazil

³CNPq researcher

Understanding the depths of the marine substrate is of vital importance for an increasing variety of fundamental purposes that contribute to the comprehension of our planet's functioning. The primary objective of this research was to map the seafloor through multibeam bathymetry, at Latitude 1° N of the mid-Atlantic ridge, NW of the Archipelago of São Pedro and São Paulo. Data were collected aboard the Hydrographic and Oceanographic Research Ship (NpqHOc) Vital de Oliveira, within the scope of the QWHALES, SeabedMap and PQ MapMar projects. An EM-122 multibeam echosounder was used, in the 12 kHz frequency range, with an opening of 60° and at a speed of 7 knots. Raw data processing was performed with Caris HIPS & SIPS version 11.4.24 software. Until this study, the selected area had not been mapped, meaning that mapping a previously unexplored region of the ocean floor represents a crucial advancement, highlighting the importance of understanding the complexity of the marine environment. The obtained results allowed the generation of a bathymetric surface map at a pixel resolution of 50 meters. With the bathymetric map, it was possible to identify the morphology of slow-spreading mid-ocean ridges. Through elevation profile, an axial valley delimited by edge faults to the axial valley was interpreted. Along the valley, there is a discontinuity with an offset of approximately 17 km from the axis in the mapped area. This metric, associated with the morphology of the expansion axis that develops a narrow and deep axial valley, allowed the classification of non-transforming displacement or second-order displacement. Finally, it was also possible to identify that this discontinuity is located between the South American and African tectonic plates.