THE STRUCTURE AND EVOLUTION OF SOUTH ATLANTIC LITHOSPHERE FROM EVIDENCE OF THE ANGOLO-BRAZIL GEOTRANSECT

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Natural observations on the Angolo-Brazil geotransect were carried out under the Program of joint studies of the Ocean by the USSR Ministry of Geology and Academy of Sciences from 1980 to 1989. The observations included: echo sounding, seismoacoustic studies, magnetic and gravity survey; DSS with source-to-receiver offset distances of 600-1000 km, reflection profiling, heat flow determinations (86 sites), core sampling (86 sites) and dredging in the rift zone along the axial main profile towards Recife-Luanda. Data interpretation suggests heterogenic structure of South Atlantic lithosphere. The central belt of orthooceanic lithosphere with spreading magnetic field, and flank belts of paraoceanic lithosphere with magnetic field going onto the continents are discerned. The belts boundaries disposed bilaterally along the ocean lie at depths of about 5000 m and are shown in seismic profiles by reflectors crossing all the three oceanic layers. All the geologic-geophysical evidence suggest asymmetry of zones disposed west and east of the axial rift. Basite-ultrabasite metamorphites dredged in the rift zone are of Precambrian, Paleozoic and Mesozoic isotopic age inferred by differnt methods. Based on DSS evidence, seismic tomography shows maltilayered structure of asthenosphere-to-lithosphere transition at depths of 100 to 30 km. All the evidence obtained favours a hypothesis of the Atlantic opening under the Earth's expansion. The ocean lithosphere evolution is caused by prolonged tectonic-thermal reworking of the ancient crust-mantle substrate.