



The Azores plateau : an example of ridge-hot spot interaction

Pascal Gente, Jérôme Dymont, Marcia Maia and Jean Goslin
UMR, IUEM, Université de Bretagne Occidentale, France

Copyright 2003, SBGF - Sociedade Brasileira de Geofísica

This paper was prepared for presentation at the 8th International Congress of The Brazilian Geophysical Society held in Rio de Janeiro, Brazil, 14-18 September 2003.

Contents of this paper were reviewed by The Technical Committee of The 8th International Congress of The Brazilian Geophysical Society and does not necessarily represent any position of the SBGF, its officers or members. Electronic reproduction, or storage of any part of this paper for commercial purposes without the written consent of The Brazilian Geophysical Society is prohibited.

Abstract

Bathymetric, magnetic and gravimetric data have been compiled for the Azores platform area, along the Mid-Atlantic Ridge (MAR) axis between 32° and 49°N and on the flanks up to magnetic anomaly (An) 13 (~38 Ma). The analysis of these data constrains the episodic character of magmatic events connected with the hot spot activity, their timing and their extension along the MAR axis. The Azores hot spot activity began at about An 6 (~20Ma), a magmatic event which marks the first construction of the Azores plateau, with a relief of more of 1500m. The plateau continued to grow northward and southward for about 13 Ma, to reach a maximum extension of about 600 km at An 5 (10 Ma). High reliefs (1000 – 2000 m above seafloor) associated to a thicker crust mark An 6 and An 5A (12 Ma) periods. These magmatic pulses propagate along the MAR axis for several hundred kilometres. A rapid (55 km/Ma) southward propagation takes place during the An 5A pulse, intersecting the Pico fracture zone which did not survive the event. After this period of magmatic construction, the Azores plateau rifted apart. Rifting began at about 9 Ma in the north and propagated southward for about 6 Ma. The oceanic crust subsequently formed at the MAR axis presents a roughness and segmentation of a classical slow spreading centre unlike the crust of the plateau which is smooth and does not show any clear segmentation. These data show that the surface expression of the Azores hot spot is discontinuous, in relation with the relative position of the hot spot and the spreading centre. The construction of the Azores plateau coincides with the superposition of the hot spot plume with the ridge melting zone, whereas its rifting coincides with the progressive shift of these two zones.