



Evolution of the Segmentation Pattern of the Mid-Atlantic Ridge between 20N and 41N, in the last 25 Ma

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The evolution of the EU-NA-NU triple junction is supposed to have been largely affected by the interaction with an Azores Hotspot. This was proposed by Schilling (1975) based on basalt geochemistry and ultrior studies, which showed a long wavelength enrichment in incompatible trace elements and isotopes that extends from the Kurchatov fracture zone near 41°N to the Hayes fracture zone near 33°N. The elevated ridge, when compared to “normal” segments south and north of Azores, the morphological high of the Azores and neighboring plateaus have been all interpreted as a consequence of the interaction between a moving hotspot and the lithosphere.

While the kinematic constrains for the development of the Azores triple junction are reasonably know (see Luis and Miranda, 2008 and references herein), the detailed evolution in the last 25 Ma only focused the Azores area (Luis et al., 1994) and relied mostly on the study of the Eurasia-North America plate pair. We present here a detailed study of the Eurasia-North-America and Nubia-North-America plate pairs, based on a new magnetic compilation of the North Atlantic, and we deduce the relative motion Eurasia-Nubia during the last 25 Ma, associated with the evolution of the Azores.

We show that the development of this plate boundary led in the Azores, to two main rifting episodes within the first one up to chron 2A leading to the development of Princess Alice Basin, and the second one focused on the Terceira Rift. South of the Azores, there is a major re-arrangement of the segmentation pattern, which is at least partially responsible for the observed topographic anomaly. Since the successive rearrangements are coeval and span spatially from 32°N to 40°N this is not compatible with the hypotheses of a cause driven by of a moving hotspot.

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