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SPATIAL AND TEMPORAL HETEROGENEITY OF THE OCEANIC MANTLE IN THE CENTRAL ATLANTIC

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ABSTRACT

Studies of Mid Ocean Ridge Peridotites (MORP) sampled from the Kane (24°N) to the Chain (2°S) transforms in the Central Atlantic reveal upper mantle domains with different composition and subjected to different thermal conditions and degrees of melting along this stretch of mid ocean ridge. These different domains include thermal minima ("cold spots"), such as observed in the equatorial area, and thermal maxima (mini-"hot spots"). Zero-age topography, gravimetry and seismic tomography support the concept of along axis mantle thermal and/or compositional heterogeneity. Close spaced sampling profiles of mantle-derived peridotites were obtained along seafloor spreading flow lines at two Latitude (0° and 11°N). These profiles indicate significant temporal variations in the composition and thermal structure of the oceanic mantle, and of processes of lithosphere creation at ridge axis.