

AGE AND FORMATION OF OCEANIC BASEMENT BENEATH THE COLOMBIAN AND VENEZUELA BASINS: MAGNETIC ANOMALY EVIDENCE

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ABSTRACT

Studies of magnetic anomalies have discerned the presence of NE-SW and E-W linear patterns in the Venezuelan and Colombian Basins respectively. Analyses of these anomalies in both basins suggest that they are due to pre-B" seafloor spreading but the small number of anomalies and fragmentary nature of the patterns make identification of their age difficult. Our analysis indicates that the anomalies are compatible with production by spreading during the Early Cretaceous and that the anomalies in each basin are comparable in age. The junction of the E-W lineations with the NE-SW lineations is interpreted as a "magnetic bright" pattern related to formation at a R-R-R triple junction.

The Colombian Basin is interpreted to be underlain by oceanic material isolated from the Farallon Plate in the Late Cretaceous. The Venezuelan Basin is underlain in part by Farallon and in part by what we infer to be Phoenix plate material separated by a fossil ridge axis. The paleolatitude of the triple junction has been determined from the skewness of magnetic anomalies as 20-30° either N or S depending on the identification of the seafloor spreading anomalies. Motion of the Farallon plate with respect to the hot spot reference frame during the Cretaceous strongly supports a southerly latitude for the triple junction. On the basis of paleolatitude, triple junction geometry, and similar spreading rates, we identify the triple junction as that of the Farallon, Pacific and Phoenix plates. The Beata Ridge may overlie the site of a hot spot track that is conjugate with the Magellan Rise on the Pacific Plate.

Since its formation in the Early Cretaceous at ~25° S, the Caribbean has apparently moved northward and eastward recording the impingement of the mantle plume now beneath the Galapagos Hot Spot at ~90 Ma and producing a thickened, oceanic plateau type crust (B") before entering the Atlantic at about 75 Ma.