

Characterizing the Structural Style and Age of the Romeral Fault Zone in the Subsurface of the Lower Magdalena Basin, Colombia

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The Romeral fault zone (RFZ) crops out over a distance of 1200 km from Ecuador to northwestern Colombia where the fault trace is buried beneath 2.8 km of Lower Miocene and younger rocks of the Lower Magdalena basin (LMB). The Romeral fault is widely accepted as the main fault boundary separating more petroliferous South American continental crust and less petroliferous, accreted Caribbean oceanic plateau crust now exposed in the Cordillera Occidental of western Colombia. We use 750 km of seismic data, 15 wells and compilation of previously published gravity and aeromagnetic data to better define the trace and history of this important crustal boundary. This data from the LMB show that the 157-km-long continuous subsurface RFZ, forms a 700-m-wide alignment of structural highs as defined by the top of the pre-Tertiary basement. Seismic and well data show that the fault zone creates an elongate high with 200 m vertical relief that became emergent during Late Eocene- Early Oligocene and shed clastic wedges to the east and west; these wedges were subsequently buried by Miocene and younger clastic rocks linked to the uplift and erosion of the northern Andes. Traces of the RFZ do not penetrate sedimentary rocks younger than Lower Miocene in age and indicate that this segment of the RFZ suture zone became inactive during the Miocene. Seismic data show that east-dipping reverse faults adjacent to the Romeral fault are presently active and localize NE- SW trending, fold axes that deform the youngest rocks of the LMB. We propose that this NE-SW shortening is part of a broad region of folding linked to shallow subduction along the South Caribbean deformed belt and collision of the Panama arc beginning about 12 Ma.