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ABSTRACT

STRAIN PARTITIONING IN THE SHALE FOLD AND THRUST BELT, EASTERN VENEZUELAN BASIN

L.Duerto [(1)], and K.McClay

1. Pedervesa

Oblique compression in the Eastern Venezuelan Basin produced three well-defined structural domains. From north to south these are: a) accreted metamorphic terranes; b) a foreland fold and thrust belt, and c) an extensional domain.

The hinterland fold and thrust belt exhibits tight folds and strong shortening of the Cretaceous units, whereas the foreland thrust and fold belt exhibits dominantly fault-bend folds in Cretaceous units and fault-propagation folds in the Mio-Pliocene shale units. This shale dominated foreland thrust and fold belt shows complex relationships between folds and different directions of faulting. Seismic interpretation of the area and geomorphological surface observations suggest two main structural orientations - contractional folds and thrust faults with an approximately E-W strike and NW-SE normal faults that strike north south and dip to the east. The structural model for the area is interpreted to be the result of local strain partitioning due to the oblique direction of contraction in the area.

Deformation occurred in three stages: 1) Folding in an EW direction in the Middle Miocene; 2) East-West fracturing and development of mud volcanism from the Late Miocene -through the Pliocene; and 3) normal faulting in a NW-SE direction from Plio-Pleistocene. The hydrocarbon potential of the area lies in the formation of traps and fluid migration related to the formation of the NW-SE normal faults which permit connection of the source rocks (below the shale sections), to reservoir rocks above the shale sequences.