Tectonics of Eastern Mexico – Gulf of Mexico and its Hydrocarbon Potential

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Abstract

Major oil and gas reservoirs occur in Mexico in seven main basins, from northwest to southeast: Sabinas, Burgos, Tampico-Misantla, Chicontepec, Veracruz, Salina del Istmo, and Macuspana y Comalcalco; over or around carbonate build-ups of buried basement horsts like the Golden Lane and Akal Horst, as well as in salt-related structures. These features are located along the Gulf Coastal Plain, onshore and offshore, between the Sierra Madre Oriental on the west and the Perdido Fold Belt, the Mexican Ridges, and the Yucatan Platform on the east. The age of the source rocks for these conventional reservoirs is Tithonian but could be even Kimmeridgian or Oxfordian. The regional migration trend for the hydrocarbons generated by these sources and accumulated in the conventional known reservoirs, came most probably from east to west, from the deepest part of the Gulf of Mexico, upward to the final traps, in different times. A series of chronological paleogeographic maps are presented in order to try to understand the regional facies distribution and the orogenic events resulting from a combination of gravity-driven passive margin near-field stress-driven type 1 systems and a continuous transpressional state of stress due to the faster movement of the northern portion of the North American Plate respect to Mexico since the Mesozoic to the present. An additional evidence for the proposed routes of migration and today's activity of the petroleum system are the numerous oil-gas seeps in the Gulf of Mexico. A reliable estimate of the undiscovered recoverable conventional petroleum resources is presented.