

How Hydrodynamism Can Enhance Hydrocarbon Entrapment?

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Abstract

Traps resulting from hydrodynamic flows have been evidenced in Petroleum Basins and been described in detail by several geoscientists in the past, emphasizing the fact that “fluids are moving rocks” mainly ruled by their pressure regimes, the sealing or carrier beds entry pressures and or hydraulic fracturation pressures. Hydrodynamism is related to the massive or diffuse circulation of often-fresh waters in sediments due to their pressure field variations. Darcean water flows are well known and observed in sedimentary rocks that are wettable (entry pressure being less than buoyancy pressure) and permeable to a certain extent - except evaporites.

More recently hydrodynamism has been demonstrated in turbiditic environment (lobe and channel type depositional complexes, in huge deltas such as Gulf of Mexico, Niger Delta, Lower Congo Basin), but with more subtle existing tilts probably limited by the relative weakness of flows in more confined sedimentary systems. No doubt that the quest for similar enhanced trapping components will be a major issue for the petroleum exploration worldwide in the coming years especially in turbiditic depositional environments where this phenomenon has been ignored or discarded.