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## Influence of Basement Transfer Faults on the Subsequent Deformation Structures in the Eastern Shallow Water Sureste Basin- Mexico

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### Summary

The Sureste basin is characterized by multiple phases of deformation which are linked to distinct tectonic events. The structural history includes: (1) rifting of the Gulf of Mexico, (2) Chiapaneca contraction associated with subduction of Cocos plate, and (3) Neogene gravity sliding. Based on integrated 2D and 3D seismic mapping in the eastern offshore Sureste basin, we were able to identify and interpret a linkage between the base-salt faults and the subsequent deformation structures.

Deposition of the autochthonous salt layer filled a Jurassic rift basin. The original salt thickness in the eastern part of the Sureste basin controlled the structural style during extension and resulted in the formation of reactive triangular salt rollers; the rollers occur in the footwall of the main extensional faults. Mesozoic supra-salt extension occurred from the Oxfordian to the middle-late Cretaceous.

The eastern edge of the Sureste Salt basin thins towards a basement feature interpreted to be a basement horst located on the east side of a rift related transfer fault zone. Tear faults approximately developed in the same location in the supra-salt strata during later Mesozoic post-salt extension. These tear faults appear to have influenced the stratigraphic filling of supra-salt extensional basins. The tear faults were reactivated due to (1) NW-directed Chiapaneca contraction, and (2) right-lateral strike-slip movement during SW-directed Catemaco gravity sliding.

Extensional tear faults in the eastern Sureste basin correspond with the eastern limit of Middle Miocene Chiapaneca thin-skin contraction. NW-SE oriented anticlines and thrusts lie to the west of the tear faults. The area to the east lacks pronounced thin-skin Chiapaneca folds.

Onshore uplift caused by subduction of the Cocos plate led to tilting of the margin and the development of a large-scale NW-directed gravity slide in the shallow water. Strike-slip displacement along the eastern limit of the gravity slide reactivated the Mesozoic tear faults. The tear fault represents the eastern limit of well-known extensional gaps such as the Comacalco and Macuspana basins in Sureste basin.

Understanding the sequence, relationship and intensity of deformational events are key in revealing the basin structural evolution and offer insights to the exploration efforts in the Mexican offshore basins.