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Ceres Fluid Flow and pressure Modelling of an Eastern Venezuelan Transect

Classical basin models handle simple geometry and were not usable for the objectives of this study. This is why the numerical research prototype Ceres, which is able to model three-phase flow in a 2D section of a basin, whose geometry changes due to deposition, compaction, erosion of the sediments, salt or mud creeping, and block displacement along faults, has been applied within the frame of this project. Ceres has been used in order to (1) define a methodology for basin modeling in thrust area and (2) to perform evaluation of the pressure and the fluid flow history at some reservoir levels.

In order to balance the section during time and to constrain the eroded parts of the section, we decided to use a forward kinematic modeling tool. The resulting scenario is then imported in Ceres.

When considering the origin of the fluids in the Oligocene sandstones of the El Furrial structure, four steps should be considered. From -65 Ma to -20 Ma: fluids are in equilibrium with the sediments. From -20 Ma to -12 Ma: the Oligocene sandstones of the El Furrial structure will receive fluids from the north. From -12 Ma to -8 Ma: fluids are expelled laterally from the Cretaceous sediments of the hangingwall Pirital. Between -8 Ma and -5 Ma the El Furrial structure becomes completely closed.