

PRODUCT SHEET



KronosFlow™
2D Kinematic Restoration

KronosFlow™ is the mandatory tool to efficiently produce 2D kinematic scenarios for petroleum system assessment in structurally complex areas.

New technology for new challenges

When it comes to assessing tectonically complex basins, conventional basin models are not sufficient as they do not accurately manage the combination of vertical and horizontal displacements. The vertical shear backstripping method commonly used for basin reconstruction cannot be applied and a real step by step restoration is required.

KronosFlow stands out from other restoration packages through its ability to honor the structural restoration of a basin without compromising the quality of the petroleum system modeling. Combining several geometrical and mechanical methods, KronosFlow is indeed able to provide geologically valid scenarios with the numerous deformation steps required for basin modeling while preserving the deformation of the mesh for accurate mass balance. This is achieved with a new meshing technology based on topology preservation with deformation. This mesh tracking is critical to properly take into account porous medium deformation, heat transfer, hydrocarbon generation and fluids migration through geological times. It allows quantitative predictions on pressure generation and hydrocarbon accumulations.

Ease of use, interactivity and efficiency

KronosFlow aims at finding the right balance between structurally acceptable kinematics and productivity. Structural geologists often restore few paleo-sections when in a logic of balancing sections while basin modeling requires many more time steps to be accurate, at minimum a basin geometry at the end of each simulated layer deposition. Ergonomics is thus a critical aspect of these new workflows combining structural restoration and basin modeling, and KronosFlow is a real step change in terms of user-friendliness and productivity for section kinematics.

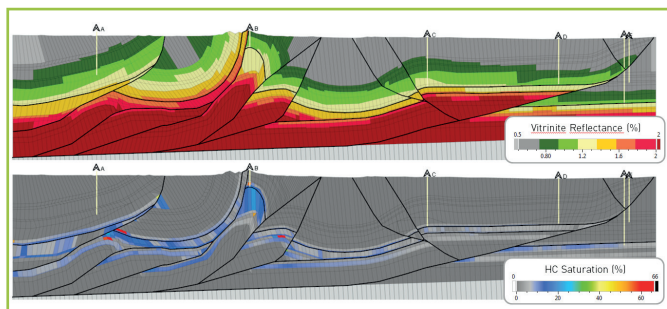
With ergonomics close to drawing software solutions, KronosFlow offers the possibility to perform backward and forward deformations with an innovative source to target definition, to restore multiple erosions, and to redraw and fix deformed geometries when necessary. Decompaction is accounted for and section consistency and compatibility with TemisFlow basin simulator is automatically checked through the restoration process.

A Scenario Manager automatically records all user's operations, allowing going back and forth, testing various hypotheses and comparing deformation methods and approaches. This innovative methodology is a major step forward as basin modeling is a discipline involving a lot of uncertainties, structural interpretation and tectonic history being major ones.

Seamless link to TemisFlow

Developed on the same platform, the OpenFlow Suite, KronosFlow is by nature integrated to TemisFlow 2D Complex Tectonics for basin and petroleum system assessment.

TemisFlow 2D Complex Tectonics is a specific module of TemisFlow which features all necessary tools to manage lithologies, kerogens and fluids information of KronosFlow models. It allows defining faults behavior through time and launching temperature, pressure, expulsion and migration simulations with its new generation calculator developed especially for complex tectonics. Running on unstructured meshes and offering a unique modeling of faults properties through time, this technology allows not only accounting properly for structures geometries at present day and through time but also simulating faults impact on water and hydrocarbon flows with a rigorous approach. All TemisFlow post-processing tools have also been adapted to KronosFlow meshes, from log and cell history extractions to the creation of zones of interest and associated reporting for an efficient analysis and understanding of the results.



Example of 2D line from Bolivia modeled with KronosFlow and TemisFlow.

Key benefits

- An interactive and intuitive tool
- Several robust deformation methods
- A kinematic tree to record and track restoration steps
- Integrated to TemisFlow for basin and petroleum system assessment