

THE 3D SPATIO-TEMPORAL MODELING IN BASIN RESEARCH: EFFECT OF THE THERMAL PARAMETERS VARIATION FOR THE SOM MATURATION IN SOURCE ROCKS-LEVEL

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The integration of the time dimension at the geological scale in basin studies and exploration geology aims at improving the interpretation of the thermal history modeling for source rocks and reservoir genetic units. In fact, the representation of geological and physical properties in the three physical dimensions allows Earth scientists to improve the identification of oil and / or gas levels. Taking into account the time dimension in basin studies representation aims at a better understanding for the SOM maturation process that operated at the geological time scale.

In the following work, we present the result obtained for an E-W cross section located in the central part of the Paris basin. The purpose of this study was to investigate the effect of the geological and geodynamic framework on the SOM maturation. For performing this duty, we firstly applied the (1D) program TherMO'S for the estimation of the burial and thermal history, at the genetic unit scale, that led to the SOM from the Liassic levels reaching their present state of maturity. Then, we used to the 3D software GOCAD to construct (3D) spatio-temporal surfaces to examine the thermal parameters variation (thermal conductivities, gradients and temperatures) related to the burial history of the basin at the geological time scale.

Key words: Paris basin, thermal parameters; basin modeling; Hettangian-Sinemurian levels; stratigraphic sequence; 3D spatio-temporal modeling.