Constrained Tectonic Heat Flow for Basin Modeling. Some Implications for Exploration in Eastern Mediterranean Basins

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ABSTRACT

Basal heat flow is a crucial parameter that influences source rock maturity. A constant value is often assigned to the basin with no consideration of spatial and temporal heat flow variations. This can result in wrong estimation of source rock maturity. Present-day heat flow values are usually based either on measured temperatures and assumed thermal properties, or on static crustal models. In either cases, the tectonic evolution of the basin and the paleo thermal constrains are neglected.

Alternatively, tectonic modelling of heat flow can provide a better means of constraining the thermal regime in the basin and its alternations through time and space.

This can have significant implications for the maturity of Eastern Mediterranean basins where relatively low heat flow values are observed.

Adopting tectonic heat flows can underline the impact of deep-water settings on present as well as paleo temperatures in the basin. In addition, the structure and composition of the underlying crust can influence heat flow history and thus the maturity of the source rocks.

Understanding the heat flow in Eastern Mediterranean basins could explain the origin of the present hydrocarbon accumulations. The contribution of possible biogenic and thermogenic hydrocarbons to the known accumulations could also be explained when the thermal regime is fully understood.