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Structure and evolution of the Kerkennah high (eastern Tunisia) based on 3D seismic

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The Kerkennah high is located in the near shore region of eastern Tunisia. It extends from the Jeffara-Djerba high in the south to the Medina-Lampadusa plateau in the north and encompasses the Kerkennah islands. A detailed knowledge of the tectonic processes affecting this area is essential in order to attempt to fully understand the controls of fracture development.
In the Kerkennah islands, the marine and continental Plio-Quaternary series crop out affected by mojor faults trending NW-SE. In the subsurface, the stratigraphic section consists of an almost complete Mesozoic-Cenozoic sequence interbedded by major unconformities.
The present-day Kerkennah high overlies an older basement lineament which may have been created during the Mesozoïc and Cenozoïc tectonic events. The 3D seismic reflection interpretation provides a good opportunity to analyze the subsurface images better than 2D seismic reflection. In fact, the geometrical characteristics of the different fault systems associated and the basin individualization are well established using 3D technique.

In this paper we present, the NW-SE and NE-SW trending extensional faults, active during the Cenozoic and Quaternary in different phases. These faults form a series of grabens that vary in length from a few to several hundred kilometers. The structuring of NE-SW en echelon faults indicates a strike slip type of bordering faults. In this work, we focus on the evolution of the tectonic structures in the basin, in particular during the Eocene to Early Pliocene extension phase.

The geodynamic evolution of Mesozoïc and Cenozoïc basins in the studied areas was dominated by several tectonic stages corresponding to a specific structural development in extension as well as in compression. This evolution will be discussed in the frame of major tectonic event that originated the opening of the Tethyan Ocean and the Mediterranean closing.