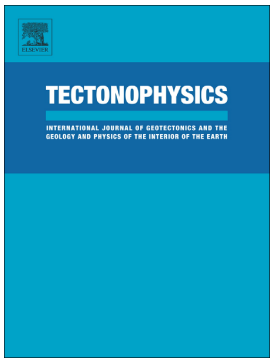

Salt tectonics and its effect on the structural and sedimentary evolution of the Jeffara Basin, Southern Tunisia

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Salt tectonics and its effect on the structural and sedimentary evolution of the Jeffara basin, Southern Tunisia

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Abstract

The Jeffara basin, as part of the North African passive margin, provides a specific type of salt-wall diapirism in Tunisia. A comprehensive study, integrating seismic, gravity, drill wells and surface geological data is performed to model the induced salt geometry and delineate its kinematics. Salt bodies, originated from the Triassic Norian series, are characterized by chaotic seismic response, higher seismic velocity and gravity mass deficit. The architecture of the marine Jeffara basin results from the complex evolution initiated by Tethyan Ocean rifting.

The reconstructed palinspastic sections together with analogic halokinetic models show the successive stages of salt movement and the development of peripheral rim synclines and associated minibasins. Arid climate Triassic developed prolific upper intertidal to supratidal coastal sabkhas bordering the Tethyan Ocean enabled the deposition of thick Triassic salt within the marine Jeffara basin. During the Early Hettangian extensional phase, associated with the opening of the Tethys Ocean, initiated a series of normal faults. Onlap reflection terminations of Late Hettangian horizons indicate the early Triassic salt rising activity. Large depocenters occurred during Santonian to Eocene; their lateral migration indicates the main active period of salt. Salt pierced the entire sedimentary cover, reached advanced salt diapir