

Structural Style Comparison between North - South Oman

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ABSTRACT

The subsurface structural styles vary across Oman. Understanding their diversity has a strong impact on optimizing hydrocarbon exploration and production. Extensive 3D seismic data has been used to help characterizing the structural styles over the PDO (Petroleum Development Oman) concession. This presentation will concentrate on the major difference in structural styles between North and South Oman with a special focus on the presence or absence of indication of the Late Cretaceous Alpine 1 and the Paleogene and Neogene Alpine 2 phases of deformation. We will illustrate that in the South Oman Salt Basin, for the post Ara salt section, local salt halokinesis has been the dominant deformation mechanism while in North Oman, regional stress fields are much more pronounced. In the South, the deformation has resulted in a tortuous framework of faults and folds. Differential loading and salt dissolution have been the dominant deformation mechanisms. In the North, the deformation has resulted in a pervasive fish net fault pattern in the absence of reactivated basement faults. When basement faults have been reactivated, the fault patterns are different, with basement strike-slip faults, reactive diapirs and inverted normal faults. In the entire area, it is possible to unravel both Alpine 1 and Alpine 2 related fault families. The recognition of North Oman and South Oman structural style provinces provide important constraints to support the seismic interpretation particularly in areas of poor data coverage or quality.