

Folding In the Zagros-Mesopotamian Region

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The external belt of the Zagros mountain chain and the adjoining Mesopotamian area possess the favourable conditions for the development of folds, that is: they are composed by a multilayer stratigraphy with an efficient detachment at its base and an alternation of competent and incompetent layers in the remaining section. Folds that developed in this region are renowned for their outstanding size, continuity and quality of exposure. Besides, these folds host some of the largest oilfields in the Middle-East. For all these reasons the folds of the Zagros fold-belt and its Mesopotamian foreland have been studied in detail since the beginning of hydrocarbon exploration, at the beginning of the 19th hundreds.

Along this almost 2.000 km long chain, folds display a huge variability in size, shape and association with other structures. Due to the high prospectivity of this region, the wide spectrum of geometries that can arise from compressing this heterogeneous multilayer is of crucial interest for the oil industry. In this contribution we try to summarise on this variability, presenting examples and discussing the factors that may govern such variableness. Examples include (Fig. 1) disharmonic folding caused by decoupling intervals, the effect of multiple detachment horizons on the finite geometry of anticlines, the effects of thickness and facies heterogeneity on fold distribution, the role of salt in the nucleation of folds and in the development of upright isoclinal synclines and anticlines. The origin of flap-folds, structures peculiar to the Zagros stratigraphy and interpreted as gravitational structures is also scrutinised. In addition, examples of anticlines in the Persian Gulf, studied by 2D and 3D seismic interpretation, permit discussing the interference between folds with different trends, the role of inherited fault structures and their multiple reactivations.

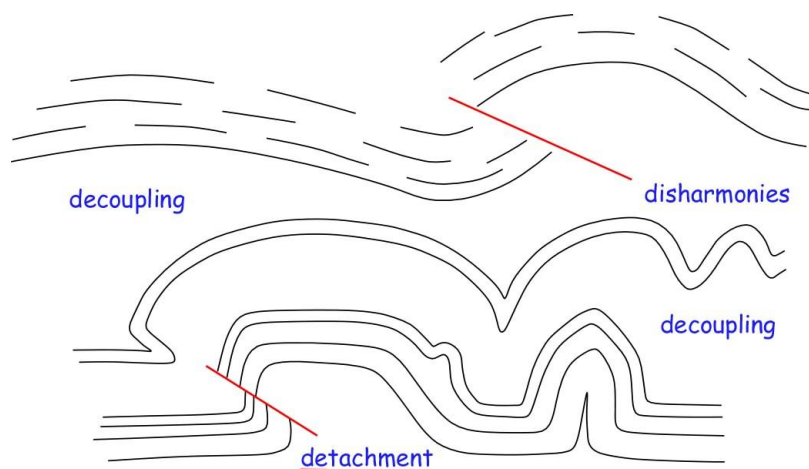


Figure 1. Idealised structures illustrating the complexity that may be associated with the folding of an anisotropic multilayer.

The common aspect of all these examples is the strong and double-directed link between stratigraphy and structure. Deformation (folding/faulting) influences patterns of sediment deposition and therefore facies and thickness, which in turn influence any later additional

contraction. The link between stratigraphy and structure is such that in many instances information from one discipline can be used to draw conclusions regarding the other discipline and vice-versa.



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