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# Mesozoic and Cenozoic structural evolution of North Oman: New insights from high-quality 3D seismic from the Lekhwair area

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## Abstract

This paper highlights the role of Triassic-Jurassic extension and late Cretaceous compression in the Mesozoic-Cenozoic (Alpine) structuring of North Oman. The syn/post-Mesozoic regional structural evolution is usually documented as a succession of two stages of deformation. The Alpine 1 phase, late Cretaceous in age, occurred in association with two ophiolite obduction stages (Semail and Masirah ophiolites). It was characterised by strike slip to extensional deformation in the North Oman foreland basin sub-surface. The Alpine 2 phase, Miocene in age, was related to the continental collision responsible of the Zagros orogen and of the uplift of the Oman Mountains. The Alpine 2 deformation was transpressional to compressional. Observation and interpretation of good quality 3D seismic in the Lekhwair High area enabled the distinction of two earlier phases. Early Mesozoic extension occurred concomitantly with the regional Triassic to Jurassic rifting, developing Jurassic-age normal faults. Late Cretaceous compression occurred prior to the main Alpine 1 phase and triggered the inversion of Jurassic-