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Loïc Bazalgette, Hisham Salem



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

By Loïc BAZALGETTE\* and Hisham SALEM, PDO, Field Development Centre, Mina al Fahal, PC100, PO-080, Muscat, Sultanate of Oman.

\* Corresponding author, E-mail: [loic.lb.bazalgette@pdo.co.om](mailto:loic.lb.bazalgette@pdo.co.om), Telephone: +968 24679063

### **Keywords:**

Oman, structural evolution, faults, seismic, Middle-East, Arabia.

### 1 **Abstract**

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

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