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Tectonics of the Zagros Orogen: An Introduction

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Around 1800 km long Zagros Fold and Thrust Belt (ZFTB) developed in the foreland region of the collision zone between the Arabian and the Eurasian plates. The belt constitutes a part of the Alpine-Himalayan orogen that evolved during opening and closure history of the Neotethys Ocean in the Neogene (Sherkati et al., 2006; review in Pash et al., 2021). The ZFTB is amongst the most prolific hydrocarbon reserves when counted in collisional orogens. Around 12% of global oil reserves come from this terrain (Bordenave and Burwood, 1990). Bordenave and Hegre (2005) stated that the ZFTB contains ~ 9% of the world's oil and ~ 15% of the world's gas reservoirs. The proven and producing reserves in Zagros are far more economic than those in any collisional orogens such as the Himalaya (e.g., Biswas et al., 2022). Fold and thrust belts in general have been questioned for the feasibility for exploration (review in Hammerstein et al. 2020). However, such a doubt did not arise for the ZFTB (Razavi Pash et al. 2024). Summarily, ZFTB is crucial in geoscientific studies (e.g., Cooper 2007).

This special volume consists of four articles that got approved out of eleven submitted articles. Two are review articles and two are original works. **Alipour (2024)** reviews the hydrocarbon system from the Iranian part of the ZFTB by compiling stratigraphic columns, maps and structural cross-sections. He recognizes asymmetric folds as the most common reservoirs, and describe the Asmari and the Dalan/Kangan carbonates as the most prolific producers of fuel. **Tavakoli and Barfizadeh (2004)** review the reservoir condition from the Iranian carbonates. The carbonates deposited in a ramp-setting and got dissolved and dolomitized. Facies transition, diagenesis, fracturing and faulting affected the reservoir property. **Nezamzadeh et al. (2024)** utilize displaced river terraces to decipher the active tectonics from the Zagros orogenic belt. Strike-slip of the Sabzpoushan Fault Zone for the last ~ 100 Ma at ~ 1–2.8 ± 0.2 mm y^{-1} deformed the crust aseismically. Several recent papers have emphasized the importance of the South Dezful Embayment in the hydrocarbon geoscience and tectonics of the Zagros and the surrounding areas (e.g., Shamszadeh et al. 2022a,b; Joudaki et al. 2024). In this line, **Afroogh et al. (2024)** investigate field data, 2D and 3D seismic lines and well data to comment on the geometric and genetic variation of structures of the Mansourabad anticline from the Dezful Embayment. These variations are crucial to understand the reservoirs in the embayment. We hope that these papers will prove useful to the Zagros geoscience researchers.

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