Geophysical Research Abstracts
Vol. 12, EGU2010-9147, 2010
EGU General Assembly 2010

Orogenic plateau growth in the Zagros of Iran

Mark Allen (1), Eric Blanc (2), and Christopher Saville (1)

(1) Department of Earth Sciences, University of Durham, Durham, United Kingdom (m.b.allen@durham.ac.uk), (2) Statoil, Drammensveien 264, Vækerø¸ N-0246 Oslo, Norway (ebla@statoilhydro.com)

This paper concerns how Turkish-Iranian plateau grows by incorporating the Zagros fold and thrust belt. The plateau's tectonic boundary can be defined as the limit of significant seismogenic thrusting, which occurs close to the regional 1 km elevation contour. The geomorphic boundary is less distinct, but occurs northeast of the limit of active thrusting, because of a time lag during which mountainous relief converts to the subdued plateau geomorphology. Most of the High Zagros and ~25,000 km2 of the Zagros Simple Folded Zone behave as part of the plateau. The Dezful Embayment is a low strain zone in the western Zagros Simple Folded Zone, implying locally strong basement. Deformation is correspondingly more intense northeast of the Embayment, where the highest elevations and steepest slopes in the Zagros occur. As a consequence of the Embayment, lateral plateau growth is more limited in the western Zagros than the east (Fars). A more uniform structure across the Fars region has produced a lower orogenic taper, and a wider region of the Zagros behaves as part of the Turkish-Iranian plateau. Climatic variation along the Zagros is likely to act as a positive feedback on this tectonic variation, although the rates are not well-constrained. Relatively high orographic precipitation northeast of the Dezful Embayment promotes exhumation. The more arid climate in the Fars region should subdue exhumation, implying quicker crustal thickening and elevation for any given shortening. This enhances lateral plateau growth. Regional plateau elevations >1 km may relate to underlying warm and partially molten mantle.