Geophysical Research Abstracts
Vol. 19, EGU2017-4622, 2017
EGU General Assembly 2017

Effect of obliquity on tectonic inversion of a basement-involved fold-and-thrust belt

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The structural evolution of basement-involved, or thick-skinned, fold-and-thrust belts is often affected by inherited basement faults that developed during earlier basin formation. A crustal-scale three-dimensional finite difference model with a visco-brittle/plastic rheology is applied to investigate the influence of oblique extension/compression during positive tectonic inversion. During extension, numerical results show overlapping normal faults striking perpendicular to the extension direction with relay ramps. Growth strata develops in the overfilled developing basin. During the post-rift phase, undeformed sediments are sealing the extended basement. The compressional phase is characterized by basement fault reactivation and localized uplift. We show that reactivation of pre-existing extensional faults is dependent on the obliquity between the strike of the basin/orogen and extension/shortening direction. Results are compared to the Kopet Dagh Mountains in NE Iran.