



## **Late Cenozoic shortening in the West-Central Alborz Mountains northern Iran: A combination of thick-skinned, thin-skinned, and lateral-extrusion tectonics**

**B. Guest** (1,2), G.J. Axen (1,3), J. Hassanzadeh (4)

(1) Department of Earth and Space Sciences, University of California Los Angeles, California, USA (2) Now at the Institute for Geology, University of Hannover, Germany, (3) Now at the Department of Earth & Environmental Sciences, New Mexico Institute of Mining and Technology, New Mexico, USA, (4) Institute of Geophysics, University of Tehran, Tehran, Iran (bernard.guest@geowi.uni-hanover.de / Fax: +490 511 762 2343 / Phone: +015 15 391 1810)

The Alborz Mountains of northern Iran have deformed in response to the Arabia-Eurasia collision since  $\sim 12$  Ma. Structural data from the west-central Alborz indicate that Late Miocene to Recent deformation accumulated in a sinistral transpressional regime by range-parallel thrust and strike-slip faulting and folding.  $\sim 17$  km of shortening across the Alborz is accommodated by westward extrusion of a crustal wedge bounded by conjugate dextral and sinistral strike-slip fault systems. The Nusha, Tang-e-Galu, and Barir fault zones, strike west-northwest, bound the north side of the wedge and, prior to  $\sim 5$  Ma, accumulated  $\sim 12$  km,  $\sim 3$  km, and  $\sim 25$  km of dextral slip respectively. The south side of the wedge is bounded by the active sinistral reverse Moshā and Taleghān faults, which merge northwest of Tehran and have a total slip estimate of 30–35 km. Line-length restored cross-sections across the range show  $28.5 \pm 0.8$  km of fold- and thrust-related range-normal shortening. Wedge extrusion, thrusting and folding yield a net shortening of  $48 \pm 3$  km across the range, within error of the shortening estimates predicted by assuming that the present-day shortening rate ( $5 \pm 2$  mm/yr) has been constant since  $\sim 12$  Ma. A 60 km long right-hand bend in the Moshā-Taleghān fault system formed a transpressional duplex south of the fault. The southern boundary of the duplex is the active Farahzād-Karaj-north Tehran thrust system. The kinematic development of this duplex has implications for seismic hazard assessment

in the heavily populated Karaj and Tehran areas.