



Lineament extraction from Landsat satellite imagery and ASTER digital elevation model: are regional strike-slip faults dissecting the Greater Caucasus belt?

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Some tectonic maps and models of the Greater Caucasus and surrounding regions display recently developed large strike-slip faults crossing the WNW-ESE orientated Greater Caucasus fold-and-thrust belt. Recent strike-slip faults are vertical or very steep by definition and hence, easily detected as lineaments in the topography. More subtle to detect are reported strike-slip faults parallel to the WNW-ESE folds and thrusts. Several Landsat band ratio combinations are used to discriminate the different lithologies and enhance the structures of the belt even though the Greater Caucasus and especially, its western and central parts, is quite vegetated. The false color Landsat images are draped on a 30 m resolution ASTER digital elevation model. Extraction of lineaments from these remote sensing data are straightforward. In addition of NW-SE and WNW-ESE lineaments, NE-SW striking lineaments are obvious. NW-SE and WNW-ESE lineaments are likely thrusts in origin and the determination of a strike-slip reactivation requires a more accurate analysis of the surrounding structures with the combined Landsat band ratio. The same sharp analysis applies to characterise the eventual faults underlying the NE-SW lineaments. In case of significant displacements along strike-slip faults, offsets of markers (beds, folds...) as well as related structures in the close vicinity of the faults (vertical folds, conjugate faults, Riedel fractures) are expected to be observed.