Geophysical Research Abstracts
Vol. 20, EGU2018-9864, 2018
EGU General Assembly 2018

Structural geometry of active Kura foreland fold-and-thrust belt revealed by seismic reflection profiles

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Our study is focused on the structural geometry of the western part of Kura foreland fold-and-thrust belt disposed in the central part of the Caucasus. Structural architecture of the Georgian part (Kartli area) of Kura foreland fold-and-thrust belt has been interpreted using seismic reflection profiles. Fault-related folding theories have been applied to constrain the seismic interpretation and construction of balanced cross-sections (Shaw et al., 2006). Seismic reflection data distinctly exhibit that the Kura foreland is an active thin-skinned fold-and-thrust belt. Building of structures of central and northern part of the Kura foreland basin was formed by Greater Caucasus basement wedge(s) propagation along detachment horizons within the cover-generating thin-skinned structures represented by Neogene-Quaternary shallow marine and thick continental sediments. Seismic reflection data reveals the presence of south-vergent fault-propagation folds, fault-bend folds, and duplex. In the southern part of the Kura foreland basin, the syn-kinematic (Middle-Upper Miocene) strata have been deformed and uplifted by passive-back thrusting at the triangle zone (frontal part of the eastern Achara-Trialeti fold-and-thrust belt - Lesser Caucasus). Seismic reflection profiles show north-vergent duplex and structural wedge at the triangle zone beneath the thrust front monocline and is represented by Cretaceous-Paleogene strata. Western part of the triangle zone of the Kavtiskhevi-Akhalkalaki area is introduced by south-vergent imbricated fan (passive-back thrusts). The imbricated fan is characterized by fault-propagation folding. The kinematic evolution of south-vergent fault-propagation folds is related to northward propagating duplex.