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Geometry and kinematics of Jaban Anticline in central Alborz, Iran
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Abstract
This paper present a geometrically constrained cross section and a kinematic interpretation with a suggestion for long term shortening rate for central part of the Alborz, as a seismically active belt. ∼10 mmyr-1 of shortening between the south Caspian Sea and the Central Iran is accommodated by the Alborz Mountain. Through the Alborz Mountains, the fundamental kinematics and structural aspects are poorly understood and radically different between proposed structural models for the Alborz suggest markedly different geodynamic processes acting in northern Iran. In order to better understanding of the structural architecture and to provide a fast track of the spatial and temporal distribution of deformation in south-central Alborz, a transect section across the study area has been constrained. The Jaban fold, which will be discussed as the core of this paper, is an important large asymmetrical folded structure in study area. Despite overall similarities in stratigraphy and structural position, the western and eastern parts of the Jaban anticline structure are display some notable differences along strike of Mosha active fault. The fold geometry of the Jaban anticline compares favorably with geometric models of duplex structure that allow forelimb thinning. It suggest that 27° anticlockwise rotation along the strike of the Mosha fault has driven the development of the transpressional Jaban duplex south of the Mosha fault. The structural cross section extends north-south ward for 27.73 km in the southeast part of the Damavand in east of the capital of Tehran. The cross section, which crosses the Jaban master fault-core fold and the Mosha Fault, shows that the deformation is dominantly thin-skinned and combined thrusting, and folding yield a total shortening of 12 km across the study area. Based upon cross section, ∼ 1.8 km of shortening is accommodated by northward relative motion of the crust. The structural cross section predicts a total shortening of 44.5% and a long-term shortening rate of 8.6 mm/yr results if the present-day shortening rate (5 ± 2 mm/yr) is assumed.
keywords:Rate of shortening;Transpression;Jaban anticline;Alborz;Iran