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Seismic hazard assessment of Azerbaijan territory using new seismological and GPS data

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On the basis of new seismological data, the map of maximum earthquake intensities for Azerbaijan and adjacent Caspian Sea territory has been plotted and analyzed. At the eastern part of collision zone of Greater Caucasus at the junction of Main Caucasus Thrust (MCT) and Kizilagadj-Vandam (K-V) faults we observe high intensity of earthquakes. This is so called Shemakhy-Ismailly seismic zone, where several destructive earthquakes occurred repeatedly within historic periods. Other parts along MCT with high intensity of earthquakes are observed in Sheki region and within Caspian Sea basin, southward from Absheron peninsula. This seismic activity is related with horizontal compression of the regional faulting system of Azerbaijan.
Zones with high intensity also exist northward from Absheron peninsula, within Lesser Caucasus and Fore-Lesser Caucasus in Bilasuvar and Ganja regions. This seismic activity is related with horizontal compression of the regional faulting system of Azerbaijan.
For estimation of the stress state of the Earth's crust, the modified map of focal mechanisms has been plotted using CASMO methodology. It was revealed that, the stress state of the Great Caucasus is in a state of near-horizontal compression, oriented mainly across to the stretching of the regional geological structures. Along MCT, trust movements predominate in N-NE direction, which results in a compression of the earth's crust along MCT.
Seismicity data have been correlated with the data of modern horizontal movements. It is known that, due to the collision of Arabian plate with Eurasian one, this segment of Alpine belt experiences concentration of the tectonic stress. Existing distribution of the horizontal rates causes different values of stress accumulation along MCT, which affected on the seismic regime of the studied area. For the purpose of revealing the relaxation between GPS rates and seismicity, we have plotted a profile and analyzed distribution of horizontal motion rates along MCT. According to the distribution of GPS rates, 4 zones have been revealed with different values of stress concentration. Such zones have also been revealed on the distribution of the earthquake epicenters cluster and exposed seismic energy. According to GPS data, at the junction zone of MCT and K-V faults sharp decreases of rates of horizontal movements are observed (or maximum shortening of earth). It is also revealed, there observes right-slip rate movement on the K-V fault.
This factor well conforms to the data about modern horizontal motion, obtained from GPS measurements. Revealed according to GPS monitoring and earthquake epicenters distribution 4 zones, with different values of stress accumulation, confirm their reliability also in a fault plane solutions.