



## **A crustal stress map for Iran deduced from seismic and geodetic computations**

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The tectonic setting of Iran is associated with active collision between Arabian and Eurasian plates and the SW motion of the south Caspian basin. The Zagros Mountain range in the west and southwestern Iran, Alborz and Kopeh Dag in the north and northeastern Iran and the N-S strike slip faulting in the eastern Iran manifest the major tectonic setting in this country.

Recent studies suggest that knowledge on geometrical complexities of fault system and direction of principal axis of stress can significantly advance our understanding about rupture initiation, propagation and arrest on pre-existing faults.

Our goal in this research is to integrate seismic and geodetic data in order to present a stress map for Iran, which can be used in detail analysis of rupture dynamics of major earthquakes in this active tectonic setting.

We used focal mechanisms of the crustal earthquakes (shallower than 40 km) in the period of 1909–2012 and combined the available GPS velocities, derived from the data collected between 1999 to 2011, to estimate the magnitude and directions of maximum principal stress and strain rates in Iran. Using the Pearson product moment correlation, we found the correlation between the stress field obtained from the focal mechanism stress inversion of earthquakes and that obtained from the seismic and geodetic strain rates computations. Our results show a strong correlation (~80%) between the directions of the principal components of stress and strain (rate) obtained using different data/methods. Using weighted average analysis, we present a new stress map for Iran which can be used in further tectonic as well as seismic hazard studies.