Geophysical Research Abstracts,
Vol. 11, EGU2009-1273, 2009
EGU General Assembly 2009

Tectonic characterization of the area between Qatar-Kazerun and Oman lines (Iran): using spatial analysis of geological and geophysical variables

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The Zagros thrust-and-fold belt is part of the Alpine-Himalayan orogenic belt. The general tectonic framework of the area is located between Qatar-Kazerun and Oman lines, southern of this active orogenic belt, is define by Zagros thrust system which is parallel to the belt and a series of transfer fault zones or lateral ramp oblique to the belt, which are associated the crustal shortening in the region. The studies of the spatial patterns of tectonic characteristics of this area has been the subject of many researches. In this research, we introduce a quantitative approach for tectonic characteristic of the area, using of geostatistical modeling. Geostatistical modeling involves the estimation of the spatial correlation described in the sample variograms and fitting models to them. For this purpose, the study area of the Zagros thrust-and-fold belt is divided into blocks using a square grid at $0.5^{\circ} \times 0.5^{\circ}$. An overlapping area of $0.25^{\circ} \times 0.25^{\circ}$ (moving step) is made for high resolution and comprehensive study, which inherently maintains the continuity of the data points from grid to grid. It seems that the geological and geophysical characteristics such as faulting, folding, lithology, topography and seismic activities could indicate reliably spatial variations of tectonics in the region. Thus, they have been calculated and recorded as quantitative variables for each block and spatial distribution of variables using of geostatistical modeling. The obtained results and their correlation with tectonic conditions of the region permit us to predict quantitatively characterizes of the tectonics of the study area. Although the Zagros presents a complex spatial distribution of tectonic, but it is possible to find some homogenous sub-areas. It is also possible to differentiate between areas with low and high probability values of the tectonic activities such as density of faulting and folding, frequency of earthquakes and diapirism, which can to be helpful for studies of the oil discovery.