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Monitoring of Fault Patterns Based on the Deflection of the Vertical Components, a Case Study in Zagros Belt

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EIGEN-6C is a new Earth Gravitational Model to degree 1420 has been developed incorporates improved 5 by 5 minute gravity anomalies and has benefited from the latest GRACE, GOCE, Lageos and Altimetry data. Due to the high altitude of the satellite, the effects of the topography and the internal masses of the Earth are strongly damped. However, the deflection of vertical components, are the second order spatial derivatives of the gravity potential, efficiently counteract signal attenuation at the low and medium frequencies. Instead of the gravity components, the deflections of vertical components basically have a special potential to show local features, which can be important in detecting possible micro-tectonic plate boundaries. In this article we review the procedure for estimating the deflection of vertical components based on the spherical harmonic coefficients of the EIGEN-6C global combined geoid model. Then we apply this method as a case study for the interpretation of possible earthquakes patterns in Zagros belt in Iran. MATLAB software has been programmed for computing the components. We found strong correlations between the components of the deflection of vertical, and earthquakes patterns in Iran. It can be used for detecting of possible hidden faults in the study areas for establishment of the deformation monitoring networks based on the GPS.