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Overview of geodynamical patterns over Iran based on the garadiametry by EGM2008 global geopotential model

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We determine the gravity gradient tensor directly from the spherical harmonic coefficients of the EGM2008 global geopotential model. EGM2008 in corporates improved 5x5 minutes gravity anomalies and has benefited from the latest GRACE based satellite solutions.The major advantage of the EGM2008 is its ability to provide precise and uniform gravity data with global data coverage.The gradiometer data, which are nothing else than the second order spatial derivatives of the gravity potential, efficiently counteract signal attenuation at the low and medium frequencies. In this article we review the procedure for estimating the gravity gradient components directly from spherical harmonics coefficients. Then we apply this method as a case study for the interpretation of possible geophysical or geodynamical patterns in Iran. We found strong correlations between the cross-components of the gravity gradient tensor and the components of the deflection of vertical, and we show that this result agrees with theory. Also, strong correlations of the gravity anomaly, geoid model and a digital elevation model were found with the diagonal elements of the gradient tensor.