Intrinsic deformation analysis of geodynamic network of Iran based on GPS

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Abstract: Based on the classical methods of deformation analysis, the horizontal and vertical deformations are studied separately and consequently this methods can't reflect the real nature of the earth surface because the crustal motion and deformation are embedded in 3-dimentional space and do not exist purely horizontal and purely vertical in term of deformations. Moreover most of the classical methods formulate the computation of deformation measures on the projection plane and therefore suffer from effects of incompleteness in the mathematical model of projection system plus affect of distortions emanate from intrinsic nature of projection model, on deformation measures. Here we applied methods that allow deformation analysis of the real surface of the earth and regarding the topographic shape of the earth for more reliable and accurate surface deformation measures. The powerful importance and aspect of this method is simplicity in the computation on 2-dimensional space versus 3-dimentional space without losing any information of third dimension on the results.

Key words: surface deformation analysis, strain tensor, finite element.