An Analysis of Strain Accumulation in Turkey

Ilke Deniz*[1]

[1]Bülent Ecevit University – Bülent Ecevit University, Engineering Faculty, Geomatics Eng. Department, 67100 Zonguldak TURKEY, Turkey

Abstract

In this study, the strain accumulation was computed from Turkish National Horizontal Control Network (TNHCN) and Turkish National Fundamental GPS Network (TNFGN) for a period of about 30 years. TNHCN was based on the European Datum 1950 (ED50), while TNFGN was based on Geodetic Reference System 1980 (GRS80). Hence, the common points which composed of more than 2500 points were produced in both ED50 and GRS80. Therefore, the latitude and longitude differences in ED50 datum were corrected with Molodensky equation.

The corrected coordinates of TNHCN and the coordinates of TNFGN were converted to Lambert conformal projection coordinates. To eliminate the effect of residual datum, two dimensional Helmert transformation was applied to the Lambert coordinates of TNHCN and TNFGN. The results of the transformation indicated that the scale parameter was not significant.

The displacement vectors are computed from the computed coordinate differences and visualized. Furthermore, the strain accumulation was computed from Lambert coordinates of 66 stations selected from more than 2500 stations. First, 96 triangles were constructed from the selected stations. Hence, strain parameters for each triangle were computed with a finite element method. The results have been indicated that the maximum principal strain is -4.23-64.11 μs, whereas the minimum principal strain is -57.83-6.92μs.

*Speaker