

About the Consonant of the Measurements in the GPS System of Points of Geodetic Network that have been Filtrated Previously with the same Points in the Projection System

Dr .Eng .Abdulrazzak Ajaj*

Abstract

This paper deals with the problem of optimal correspondence between two sets of geodetic points; the points that obtained from filtration of (x', y') coordinates with correspondent points in the plane system. The first stage of treatment starts using a first degree transformation, where the derivation of equations took into consideration the properties of congruent representation of a plane onto itself using complex functions. In order to demonstrate the efficiency of using GPS measurements, an appropriate filtration approach was applied on the differences D_x, D_y , which give a new set of points (x', y') . then a specific approach proposed by the authors using suggested Transformation taking into account the properties of congruency (or conformability) between the last set of points (x', y') and the new set (X'', Y'') . accordingly, the final set (X'', Y'') was matched by their correspondent set of points in the plane coordinates system. In order to show the efficiency of suggested Transformations, the proposed approach was applied on the pre-filtered set chosen from first and second order networks, as well as using the set of points derived from GPS data.

The research results show the efficiency of such approach to find the optimal correspondence between two sets of geodetic points; one set came from GPS measurements and the second one came from the plane coordinates system. Using the histogram that shows the differences between the transformed coordinates and their correspondences in the plane, we found that these data converge the Normal distribution. A final point; this approach preserve original cadastral and surveying maps without having to replace them which results in high additional costs that can be spared.

Key words: Consonant of measurements, Filtration, Filtrated Coordination's, Normal distribution, Conformal projection, Plane System.

For the paper in Arabic see pages (73-87).

* Associate Professor-Department of Topographical Engineering Faculty of Civil Engineering, Damascus University, Syria.