

Definition of a Unique Transformation Parameters for Bursa Metropolitan Municipality Area of Responsibility

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Key words: Cartography; GNSS/GPS; Datum; Transformation; Ground control points; Triangulation network; Molodensky

SUMMARY

In the frame of Bursa Metropolitan Municipality 1/1000 Scale Digital Photogrammetric Line Map and Orthophoto Production Project, one of the important demands were to define a unique transformation parameters for the area of responsibility of 12000 km². Main target was to correlate the products produced in ITRF96 Datum and epoch 2005.0 with the European Datum 1950 which was the previous Datum of Turkey up to 2005.

When the Project area is examined, the existence of 119 different transformation parameters was determined, belonging to previous mapping and survey Project in the Project area and surroundings.

Data belonging to 109 Different transformation are provided from related governmental organizations. Total number of Joint Ground Control Points set of different projects in both datum were 954.

Previous transformations were realized either Bursa & Wolf or Molodensky & Badekas Helmert Similarity transformation methods as per governing regulations. All groups are controlled, conjugate points were extracted and a group of 887 Points defined as Transformation Set.

A set of 12 First and Second Order Triangulation network point, found living firmly in the field and added to Transformation set.

Different type of transformations are executed; Namely , Helmert , Similarity Transformation , Direct Solution and Hybrid solution of Helmert Similarity & Direct Solution.

During this performances; some constraints were used especially based on the previous 1/1000

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Photogrammetric Line Map Production datum transformation. In this respect Deductive and Inductive algorithm, then direct solution and hybrid solutions via integrating this methods are used, evaluated and discussed.

In addition a study to check the effective application zone of the defined transformation parameters is executed, results are discussed and a unique transformation parameters are defined which fits existing parameters best.

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