

DETERMINATION OF VELOCITY FIELD AND STRAIN ACCUMULATION OF
DENSIFICATION NETWORK IN MARMARA REGION

by

İlke Deniz

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DENSIFICATION NETWORK IN MARMARA REGION

APPROVED BY:

Assoc. Prof. Haluk Özener
(Thesis Supervisor)

Prof. Onur Gürkan

Prof. Tefrik Ayan

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ABSTRACT

DETERMINATION OF VELOCITY FIELD AND STRAIN ACCUMULATION OF DENSIFICATION NETWORK IN MARMARA REGION

For the implementation of constructing continuously operating reference stations and determination of transformation parameters, Turkey has started a new project: Turkish Continuously Operating Reference Stations (CORS-TR). Network-120, Network-90, and Network-60 were created as CORS test networks. These networks were composed of 115 check points which were established by institutions such as Geodesy Department of Kandilli Observatory and Earthquake Research Institute of Boğaziçi University, Istanbul Metropolitan Municipality, General Command of Mapping (GCM), General Directorate of Land Registry and Cadastre, and TUBITAK Marmara Research Center (MRC) in Kırklareli, Tekirdağ, Bursa, Bilecik, and Adapazarı. Before the 1999 earthquake, positions of 115 check points which are tied to Turkish National Fundamental GPS Network (TNFGN) were determined by different time and institutions.

Between July 15 and October 30, 2006; corporations such as TOPCON, TRIMBLE, and LEICA made observations. They evaluated CORS test networks. TOPCON and TRIMBLE measured all of CORS test networks, but LEICA measured only Network-60. Positions of main points of test networks were calculated and points were tied to International GNSS Service (IGS).

The purpose of this study is to provide analysis of datum of 1999 observations and unity of datum, to analyze evaluation and computation of coordinates of 2006 observations, and to examine unity of datum in 2006 observations. It will also describe the

determination of velocity field, strain accumulation on test field by modeling difference vectors between the coordinates of check points and the comparisons with other studies. The difference vector between the coordinates of check points in 1999 and 2006 (observed and computed by different companies) were derived.

ÖZET

MARMARA BÖLGESİ'NDEKİ SIKLAŞTIRMA AĞINDA HIZ ALANI VE GERİLİM BİRİKİMİNİN BELİRLENMESİ

Kırklareli, Tekirdağ, Bursa, Bilecik, Adapazarı'nda İstanbul Büyükşehir Belediyesi, Harita Genel Komutanlığı, Tapu ve Kadastro Genel Müdürlüğü, TUBITAK Marmara Araştırma Merkezi gibi kuruluşların tesis ettiği ve 1999 depremlerinden önce konumları Türkiye Ulusal Temel GPS Ağı'na bağlı olarak farklı zamanlarda ve ağlarla belirlenen 115 kontrol noktasıyla Ağ-120, Ağ-90 ve Ağ-60 olarak üç ağ oluşturulmuştur. 115 noktadan oluşmaktadırlar.

15 Temmuz–30 Ekim 2006 tarihleri arasında TOPCON, TRIMBLE ve LEICA gibi şirketler bu noktaları ölçmüş ve değerlendirmişlerdir. TOPCON ve TRIMBLE üç test ağını, LEICA sadece Ağ-60'ı ölçmüştür. Test ağının ana noktalarının koordinatları IGS'e bağlı olarak hesaplanmıştır.

Bu çalışmada, 1999 koordinatlarının datumlarının incelenmesi ve datum birliğinin sağlanması, 2006 ölçmelerinin değerlendirmelerin ve koordinat hesabının incelenmesi ve tüm koordinatların datum birliğinin olup olmadığının irdelenmesi, kontrol noktalarındaki fark vektörlerinin modellenerek test alanında hız alanının, test alanında gerilim birikiminin belirlenmesi ve diğer çalışmalarla karşılaştırılması amaçlanmıştır. 1999 ve 2006 yıllarındaki koordinatların farkları bulunmaktadır.