

# Realization of Dubai Emirate Datum on the Reference Frame 2000

Y. Al MARZOOQI, H. FASHIR, and Syed Iliyas AHMED, Dubai , United Arab Emirates

**Key words:**

## SUMMARY

With The growing capabilities of GPS as a high precision positioning system for surveying and mapping and to keep pace with the technology the Dubai municipality (DM), Dubai UAE, established FIVE GPS reference stations called Dubai Virtual Reference System (DVRS) which operate continuously for 24 hours a day. To define these stations precisely on International Terrestrial Reference Frame 2000 (ITRF2000), DM in cooperation with University Technology Malaysia (UTM) has derived the precise coordinates of these five stations on ITRF2000.

Dubai GPS Network control, which was connected to the ITRF-93 reference frame, is being used in the Emirate for surveying activities and followed by the establishment of DVRS. Originally these station coordinates are defined on the ITRF-93 frame. Now the transformation parameters are calculated between the two reference frames.

The data from five (5) DVRS stations together with eight (8) IGS stations from weeks 1160 to weeks 1177 have been used in the preliminary data processing and for statistical analysis. The eight (8) IGS stations surrounding Middle East have been included in the processing in order to determine the DVRS stations coordinates on ITRS2000 reference frame. To get high precision results the Bernese GPS processing software version 4.2 was used.

There were pre-processing for daily and weekly solutions, the rms error for the triple-difference was around 1.5cm. A total of 18 weekly solutions were taken for network adjustment. A posteriori sigma of unit weight of 0.0017m was achieved. The accuracy of DVRS stations with respect to the IGS2000 reference frame is of the order of 6-13 mm in the horizontal component and 15mm in height. Helmert transformation parameters were derived between ITRF93 and ITRF2000.