



Investigation of the Effects of Solar and Geomagnetic Changes on the Total Electron Content: Mid-Latitude Region

Mustafa Ulukavak (1,2,3) and Mualla Yalcinkaya (2)

(1) mulukavak@gmail.com, (2) Karadeniz Technical University, Trabzon, Turkey, (3) Harran University, Şanlıurfa, Turkey

The Global Positioning System (GPS) is used as an important tool for ionosphere monitoring and obtaining the Total Electron Content (TEC). GPS satellites, positioned in the Earth's orbit, are used as sensors to investigate the space weather conditions. In this study, solar and geomagnetic activity variations were investigated between the dates 1 March-30 June 2015 for the mid-latitude region. GPS-TEC variations were calculated for each selected International GNSS Service (IGS) station in Europe. GNSS data was obtained from Crustal Dynamics Data and Information System (CDDIS) archive. Solar and geomagnetic activity indices (K_p , F10.7 ve Dst) were obtained from the Oceanic and Atmospheric Administration (NOAA), the Canadian Space Weather Forecast Centre (CSWFC) and Data Analysis Center for geomagnetism and Space Magnetism Graduate School of Science, Kyoto University (WDC) archives. GPS-TEC variations were determined for the quiet periods of the solar and geomagnetic activities. GPS-TEC changes were then compared with respect to the quiet periods of the solar and geomagnetic activities. Global Ionosphere Maps (GIM) IONEX files, obtained from the IGS analysis center, was used to check the robustness of the GPS-TEC variations. The investigations revealed that it is possible to use the GPS-TEC data for monitoring the ionospheric disturbances.