

# **Analysis of Ionospheric Anomalies due to Space Weather Conditions by using GPS-TEC Variations**

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**Key words:** GNSS/GPS; Ionosphere; Space Weather Condition; Geomagnetic Storm; Solar Activity; GPS-TEC

## **SUMMARY**

The Global Positioning System (GPS) is used as an important tool for ionosphere monitoring and obtaining the Total Electron Content (TEC) variations. GPS satellites, positioned in the Earth's orbit, are used as sensors to investigate the space weather conditions. In this study, changes in the ionospheric TEC, which originated from space weather conditions (Solar and geomagnetic activities), were investigated at different time periods and latitudes around the world. GPS observations used to obtain GPS-TEC variations were obtained from International GNSS Service (IGS) stations at North and South Regions (equatorial and mid-latitude). The GPS-TEC changes obtained from the GPS observations of each IGS station were analyzed using the quartile-based statistical analysis (15-day running median) method. This study was carried out to determine the ionospheric TEC anomalies originating from different space weather conditions at different times in a total of 28 different regions selected at equatorial and mid-latitude regions. Instantaneous GPS-TEC variations are revealed by using 15-day running median statistical analysis method with examining the solar and geomagnetic activity indices. The investigations revealed that it is possible to use the GPS-TEC for monitoring the space weather conditions. This study is supported by TUBITAK CAYDAG grant no. 116Y109.

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