TECの準リアルタイム導出と宇宙天気モニターとしての応用

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Quasi-Real Time Derivation of TEC and its application for Space Weather Monitoring

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Continuous monitoring of ionospheric conditions is essential to monitoring and forecasting space weather. The worldwide use of global navigation satellite systems like the GPS makes it possible to continuously monitor the total electron content (TEC) of the ionosphere and plasmasphere up to a height of about 20 000 km. We have developed a system for deriving the TEC from GEONET data rapidly and we use the TEC distribution over Japan in the daily operations of the Space Weather Forecast Center at NICT (RWC Tokyo of ISES). Using instrumental biases from a few days before enables us to drastically shorten the processing time for deriving TEC. The latest TEC values (with a delay of about an hour) are obtained every 3 hours, and most of the values are within 2 TEC units of the actual TEC. The TEC plot is now open for public use in Japan and is available at http://wdc.nict.go.jp/gps-tec/latest_tec.html. We have found our system for deriving TEC rapidly to be useful for continuously monitoring the progress of ionospheric storms under any ionospheric conditions, even those under which the usual ionosonde observations are unable to obtain F-region profiles.