

A new data format to promote international exchange and share of GNSS-TEC data

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Several 100 km to 1,000 km scale ionospheric variations caused by equatorial plasma bubble and/or travelling ionospheric disturbances can degrade single-frequency GNSS positioning and differential GNSS positioning. However, these ionospheric disturbances have not been monitored enough due to the lack of dense wide-coverage ionospheric observations. One of the most effective methods for such dense and wide-coverage ionospheric observations is two-dimensional TEC observations using a dense GNSS receiver network. Dense GNSS receiver networks are now available only limited areas such as Japan, North America, and Europe. It is needed to expand the GNSS-TEC observation area using all the available GNSS receiver networks with international collaboration of ionosphere and space weather researchers in the world. We propose a new data format, GNSS-TEC Exchange format (GTEX), to promote international exchange and share of GNSS-TEC data. The main concept of the GTEX is to include slant TEC data from each GNSS receiver. By sharing slant TEC data which are not converted to vertical TEC, various ionospheric studies may be possible without affected by specific analysis procedures such as satellite/receiver bias estimation, or different mapping heights. The structure of GTEX is designed to be as close to the format of GNSS observation data (RINEX) as possible, because RINEX is a de facto standard in exchanging GNSS observation data and potential users of GTEX would be familiar with RINEX. We will present recent activities related with GTEX in AOSWA, ICAO/ISTF, and ITU-R.