

PEM006-P07

Room:Convention Hall

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Study of impacts of ionospheric irregularities associated with plasma bubbles on GNSS and its day-to-day variability

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GNSS (Global navigation satellite system) has been widely used for various applications. Ionospheric irregularities are one of the most serious issues that prevent advanced use of GNSS. Plasma bubbles are among those irregularities that have a great impact on GNSS. Characterization of the ionospheric irregularities are demanded by GNSS applications to realize the high level of services with reliability.

For differential GNSS applications, spatial variability of the total electron content (TEC) is most important, because it directly leads to positioning errors and threatens safety. However, it has not been well studied. Scintillation of GNSS signals due to small-scale irregularities is another aspect of plasma bubble's impact on GNSS degrading the quality of signals.

Indeed, importance of the characterization of the ionospheric irregularities in the low latitude regions has been recognized in the GNSS community, especially in the field of air navigation that requires extremely high level of safety.

Electronic Navigation Research Institute (ENRI) is contributing to International Civil Aviation Organization (ICAO) to provide ionospheric information needed by their own applications. ENRI's activities on this issue are (1) ionospheric data (TEC, TEC gradient, and scintillation) collection in the low latitude regions and (2) leading coordination of the ionospheric data collection in the Asia-Pacific region collaborating with ICAO.

At the meeting, these activities of ENRI including the plan of observation network will be presented more in detail. We believe that these studies should be an important part of the CAWSES-II or ISWI activities and that more attentions should be paid to.

Keywords: ionosphere, plasma bubble, observation network, GNSS, space weather application