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## Ionospheric Disturbance Maps as a Tool for Possible use in Air Navigation

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**Becker-Guedes, F.; Nicoli Candido, C. M.; Chingarandi, F. S.; Santos, S. P. M.; Galera Monico, J. F.**

In this work, we consider an approach to deliver straightforward ionospheric information in distribution maps of perturbations around specific locations. The use of GNSS for air navigation has various benefits, but its real capabilities for high precision applications depend strongly on our knowledge about the surrounding conditions of the ionosphere. When such systems are used, the reliability degree of the obtained data must be considered with the help of as much additional information as possible. One way to approach this problem is to probe the disturbance level of the ionosphere considering the development of the ROT (Rate of Total Electron Content) and S4 scintillation index in the vicinity of the regarded sites. At equatorial and low-latitude regions, the proximity of the geomagnetic equator, with its recurrent ionospheric irregularities, and the influence of the equatorial ionization anomaly (EIA), with its large TEC gradients, can decrease the reliability of GNSS data significantly. Some case studies were analyzed to create situational maps and to follow the disturbances time evolution in sites near the geomagnetic equator and the crest of the EIA. The objective is to find the probable development of the ionospheric irregularities position in the subsequent minutes or hours, based on its initial geographic distribution and considering the current space weather conditions in a more direct way. This procedure could be developed to be continuously distributed as ionospheric warnings by space weather centers. Pilots or air traffic control facilities could employ this simplified ionospheric disturbance maps to help their decisions. The maps would serve as an additional tool to better evaluate what to expect ahead in individual flights considering the integrity of GNSS-derived solutions for navigation.

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