



Global distribution of ionospheric scintillations from the Real-Time GPS ROTI

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A global real-time monitoring system has been implemented in the frame of ESA-ESTEC/EGNOS-PO-funded project MONITOR. It is based on world-wide GNSS datastreams distributed by means of NTRIP and provides multiple ionospheric indices and products to the scientific community and industry. In particular, the Rate Of Total Electron Content Index (ROTI) proxy, which is correlated with scintillation activity and has been running for several years for real-time detection and monitoring. It shall also be pointed out that the multiple products, also aiming at the identification of Travelling Ionospheric Disturbances (TIDs), Solar Flares overionization, among other ionospheric perturbations, are useful to properly characterize scenarios where these could occur simultaneously to scintillations. Apart from that, we will also consider the new proxy suitable for radio-occultation GNSS measurements, named OSPI.

In this context, a climatological ionospheric scintillation study will be conducted in different latitudinal regions from the database of global ROTI. For this purpose, we will obtain results for several receivers in 30-degree latitudinal strips and distinguishing between North- and South-Hemisphere locations.

Linking to the scientific applications, we will consider characterizing ROTI impact on EGNOS performance degradation events, such as St. Patrick's Day geomagnetic storm in 2015. Furthermore, we envisage to do a preliminary characterization of the ionospheric activity identified from high-rate ROTI values. For this purpose, a representative case could be selected considering post-processing data from a limited number of high-rate receivers (such as from iMoniS stations within MONITOR Network). Last but not least, assessing the possibility to use L2C new GPS signal instead of L2 to derive ROTI values could be an additional outcome.