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Status of NeQuick G after the Solar Maximum of Cycle 24

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ABSTRACT

The Solar Cycle 24 will not be recorded as the most intense of the last cycles. In fact, its intensity is half of the previous one and the ionospheric effects experienced in this cycle have been far milder than one could expect, even there were several major ionospheric storms in this period, as the so-called St. Patrick ionospheric storm. On the other hand, in this same period of time the Galileo system has been deploying its final satellites and it started the In-Orbit-Validation campaign on 2013 with the first 4 full operational satellites, following the launch of more satellites to reach the Full Operation Capability (FOC) by 2020. Thus, during this period of time Galileo has been sending the 3 Az coefficients needed to use the NeQuick G, see [1], for correcting the ionospheric delay for single frequency users.

In this work, the full analysis of the performance of the NeQuick G for the last Solar Cycle will be presented along with the detailed analysis of the most relevant Ionospheric storms occurred during the very same period. Moreover, due to the continuous deployment of Galileo satellites, the impact of the increasing number of satellites will be also shown in the performance of the obtained STEC and the stability of the broadcast Az coefficients. In general, the NeQuick G presents around 50 cm better RMS than the GPS broadcast model for all the period of study, see figure 1. As an internal measure of the goodness of the NeQuick G, the percentage of STEC inside of specification will be also analysed.

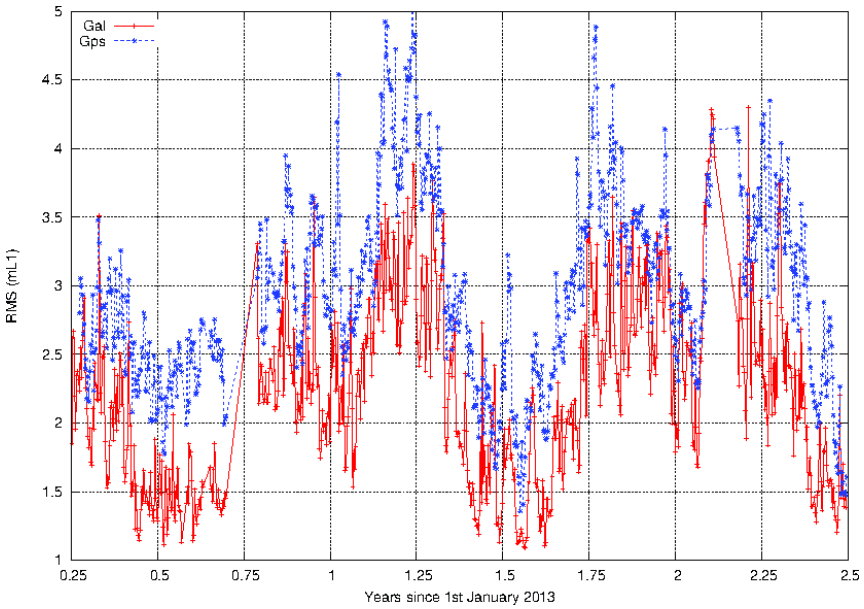

Figure 1: Global RMS from March 2013 for NeQuick G (GAL) and Klobuchar (GPS) models with a net of more than 100 IGS receivers.

References

[1] European GNSS (Galileo) Open Service "Ionospheric Correction Algorithm for Galileo Single Frequency Users". European Comission 2015. DOI:10.2873/685913