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# Testing Ionospheric models for precise positioning

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In the last 20 years, the ionospheric modeling has been improving due to several factors. The most important ones would be the emerging of multi-constellation GNSS and the improvement on the data analysis. In this regard, the testing of ionospheric modeling has become very important to identify the strength of the different calculations. The IGS ionospheric working group is contributing to this subject in two fold manner: 1) Providing reference ionospheric maps (known as Global Ionospheric Maps, GIM) to the scientific community; 2) developing new testing strategies to check the performance of the delivered maps.

Almost in parallel, high accuracy position approaches have seen the light, for instance the WARTK concept [1], PPP-Wizard [2] and Fast-PPP [3]. Contrary to the common believe that multi-frequency solutions would not use ionosphere information, these concepts use the knowledge of the ionospheric delay to improve the position solutions. This fact allows the ambiguity fixing and/or the fast convergence of the solution. One has to keep in mind that the ionospheric information has to be as precise as possible to achieve such goals.

Thus, in this work the testing of the different ionospheric models and computation strategies will be evaluated. The main tested models will be the ones provided by IGS, which in this case will be IGS final and UQRG quick Global Ionospheric Maps (GIM). These maps will be completed with ionospheric maps (regional and/or global) computed by means of using 3D geometry approaches, such as 2-layer voxel and multi-layer algorithms; and single-layer algorithm. This will allow testing the suitability of the ionospheric models in both ionospheric delay and positioning domains.

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