

Terms of Reference for the IGS Ionosphere Working Group

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on behalf of the GPS-IONO Group

Initial version: June 5, 1998 (Joachim Feltens)
1st update: December 6, 2000 (Joachim Feltens)
2nd update: September 16, 2002 (Manuel Hernández-Pajares)
3rd update: December 6, 2010 (Andrzej Krankowski)

General Goals

The IGS Ionosphere Working Group is a long-term working group (WG). It exploits the permanent IGS network of stations and the IGS infrastructure to derive global IGS ionosphere maps and IGS ionosphere models. The WG's major task consists of the routine provision of IGS Global Ionosphere Maps based on a combination of ionosphere maps regularly produced by IGS Ionosphere Associate Analysis Centers (IAACs).

Another important goal consists of the validation of the IGS Ionosphere Maps. Validations based on self-consistency tests shall be run routinely, and their output shall enter into the combination weights. Additional kinds of validation shall be performed, concretely with VTEC derived from TOPEX, Envisat and Jason dual-frequency altimeter data. Further types of validations might be performed, these may run only for a limited time. These validation activities may lead, long-termed, in the collaboration with the ionosphere community, to an IGS Ionosphere Model.

New Work Plan 2010-2013

The following goals should be achieved in the time period beginning 2010 to end 2012:

- a) Increase of IGS GIMs temporal resolution from current 2 hours to 1 hour. UPC and ESA conduct test on 15-minute maps, which have been tested successfully in terms of accuracy and reliability for Solar Maximum and Solar Minimum conditions.
- b) Publication of the first public UPC near real-time ionospheric product in the context of RT IGS pilot project.
- c) Potential use of improved of electron density retrieval techniques from GNSS LEO data (F3/COSMIC) to be used in new future IGS ionospheric products
- d) Development, in cooperation with different involved colleagues of IGS, of a simple open source subroutine to correct higher order ionospheric correction (potential companion of new section of IERS recommendations on higher order ionospheric terms)
- e) Predicted IGS GIMs – 1 and 2 days ahead, combination conducted by UWM to be started as official/routine product

Products

- a) final GIM (please note that GIMs also include GPS and GLONASS stations and satellites DCBs)
 - combination of CODE, ESA, JPL and UPC iono products conducted by UWM
 - temporal and spatial resolution - at 2 hours x 5 deg. x 2.5 deg (UTxLon.xLat.),
 - availability with a latency of 11 days
- b) rapid GIM
 - combination of CODE, ESA, JPL and UPC iono products conducted by UWM
 - temporal and spatial resolution - at 2 hours x 5 deg. x 2.5 deg (UTxLon.xLat.),
 - availability with a latency of less than 24 hours
- c) predicted GIM for 1 and 2 days ahead (pilot product)
 - combination of ESA and UPC iono products conducted by ESA
 - temporal and spatial resolution - at 2 hours x 5 deg. x 2.5 deg (UTxLon.xLat.),
 - availability 24 and 48 hours in advance

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References

Hernandez-Pajares M., Juan J.M., Sanz J., Orus R., Garcia-Rigo A., Feltens J., Komjathy A., Schaer S.C., Krankowski A., 2009, *The IGS VTEC maps: A reliable source of ionospheric information since 1998*, Journal of Geodesy 83, 3, pp. 263-275.