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Present and Future IGS Ionospheric Products

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The purpose of this paper is, on one hand, to show the present performance of the combined final and rapid IGS global ionosphere maps (GIMs), and on the other hand to inform the geodetic community on new product – predicted IGS GIMs. In addition, information on future development of IGS ionospheric products will be also presented. Nowadays, the Ionosphere Working Group of IGS generates three types of ionospheric products: final, rapid and predicted, respectively. There are currently four IGS Associate Analysis Centres (IAACs) for the ionospheric products: CODE (Center for Orbit Determination in Europe, University of Berne, Switzerland), ESA/ESOC (European Space Operations Center of ESA, Darmstadt, Germany), JPL (Jet Propulsion Laboratory, Pasadena, U.S.A) and gAGE/UPC (Technical University of Catalonia, Barcelona, Spain). These centres provide ionosphere maps computed with different approaches. Their maps are uploaded to IGS Ionosphere Product Coordinator, who computes official IGS combined products. Since January 2008, this coordination is carried out by the GRL/UWM (Geodynamics Research Laboratory of the University of Warmia and Mazury in Olsztyn, Poland). The IGS GIMs are provided in Ionosphere Exchange (IONEX) format with spatial resolution of 5.0 degrees in longitude and 2.5 degrees in latitude, and temporal resolution of 2 hours. Latency of the final and rapid GIMs is 10 days and 1 day, respectively. In November 2009, the IGS Iono WG started to generate predicted ionospheric products 1 and 2 days in advance (requested for ESA's SMOS mission). These new IGS products are currently based on predicted ionosphere maps prepared by UPC and ESA. During period of more than 10 years of continuous IGS ionosphere operation, the techniques used by the IAACs and the strategies of combination have improved in such a way that the combined IGS GIMs are now significantly more accurate and robust. Future plans include, among others, increasing temporal resolution to 1 hour and studies on taking advantage of COSMIC occultation data.