عنوان مقاله:

GPS Precise Point Positioning for Assessing GNSS and Satellite Altimetry Combined Global Ionosphere Maps

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خلاصه مقاله:

For the space geodetic techniques, operating in microwave band, ionosphere is a dispersive medium; therefore signals traveling through this medium are affected proportional their frequencies. This effect allows gaining information about the parameters of the ionosphere in terms of Total Electron Content (TEC). The classical input data for development of Global Ionosphere Maps (GIM) is obtained from dual-frequency Global Navigation Satellite System (GNSS) observations. However, the GNSS stations are in-homogeneously distributed, with large gaps particularly over the sea surface, which lowers the precision of the GIM over these areas. On the other hand, dual-frequency satellite altimetry missions such as Jason-1 provide information about the ionosphere precisely above the sea surface. In our recent studies, we developed GIMs from combination of GNSS observations, satellite altimetry. The combined GIMs provide a more homogeneous global coverage and higher reliability than results of each single method. In this study the obtained combined ionosphere models, referred to as the IGG (Institute of Geodesy and Geophysics) GIMs, are evaluated through GPS single-frequency Precise Point Positioning (PPP), using different positioning techniques. These techniques are the dual-frequency PPP which by the first approximation is an ionospheric-free combination and serves as a basis for our calculations, the single-frequency positioning using ionosphere corrections from Center of Orbit Determination in Europe (CODE) GIMs and the single-frequency PPP applying ionospheric corrections from the IGG combined GIMs.

کلمات کلیدی:

Single-frequency Precise Point Positioning; Global Ionosphere Maps; Global Navigation Satellite System; Satellite altimetry