



Global Ionosphere Maps of VTEC from GNSS, Satellite Altimetry and FORMOSAT-3/COSMIC Data

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For the space geodetic techniques, operating in microwave band, ionosphere is a dispersive medium; therefore signals traveling through this medium are affected with respect to their frequencies. This effect allows gaining information about the parameters of the ionosphere in terms of the Vertical Total Electron Content (VTEC). In the last decade dual-frequency observations of the Global Navigation Satellite System (GNSS) have supplied a basis for development of Global Ionosphere Maps (GIM) of the Total Electron Content. In our recent studies we developed GIMs from GNSS observations, combined with data from dual-frequency satellite altimetry missions by using spherical harmonic expansion. The combined GIMs connect the advantages of the different techniques and, thus, provide more homogeneous global coverage and higher reliability. The approach is based on the representation of the ionosphere as a single layer model. In this study we combine the GNSS and satellite altimetry data with global VTEC data derived from the occultation measurements of the Formosat-3/COSMIC mission. We apply recursive parameter estimation in order to improve our GIMs from GNSS and altimetry by the COSMIC data. We present first results and discuss the improvements.