

BDGIM: A new global ionospheric correction model for BeiDou-3 system

Yuanbin Yuan⁽¹⁾, Ningbo Wang⁽²⁾, Zishen Li⁽²⁾, Xingliang Huo⁽¹⁾

(1) Institute of Geodesy and Geophysics, Chinese Academy of Sciences, China

(2) Aerospace Information Research Institute, Chinese Academy of Sciences, China

A new BeiDou global ionospheric model (BDGIM) was proposed for the single-frequency ionospheric delay correction of the third phase BeiDou navigation satellite System (BDS-3). We presented an initial performance assessment of BDGIM over both China and global areas. For regional analysis, broadcast coefficients of BDGIM were provided by the operational control system (OCS) of BDS, while for global analysis, the coefficients of BDGIM were estimated using Global Positioning System (GPS)-derived total electron contents (TECs) obtained from 19 globally distributed tracking sites. Over China area, the performance of GPS Ionospheric Correction Algorithm (ICA), modified Klobuchar of BDS-2 (BDSKlob), NeQuick Galileo (NeQuickG) and BDGIM were evaluated by GPS TECs derived from 40 test sites of the Crust Movement Observation Network of China (CMONOC) during day of year (DOY) 060-181, 2015. On the global scale, the ionospheric TECs derived from 50 ground GPS sites of the International GNSS Services (IGS) and global TEC maps were used as references during DOY 220-365, 2014. The results show that BDGIM exhibits the best correction capability, which outperforms GPS ICA and NeQuickG by 17.9 and 12.6% over China, and by 22.5 and 11.6% on a global scale, respectively, during the test period.