SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Space-Based Navigation Systems and Services (1)

Author: Dr. Hongzheng Cui
1)Science and technology on aerospace flight dynamics laboratory, Beijing, China;2)Beijing aerospace control center, Beijing, China;, China

Prof. Geshi Tang
China
Mr. Baiyan Song
1Science and technology on aerospace flight dynamics laboratory, Beijing, China2Beijing aerospace control center, Beijing, China;, China
Dr. Songjie HU
1)Science and Technology on Aerospace Flight Dynamics Laboratory, China,2)Beijing Aerospace Control Center, China, China

INITIAL DATA PROCESSING ASSESSMENT OF THE COMPASS SATELLITE NAVIGATION SYSTEM

Abstract

The development of the Chinese Satellite Navigation System (COMPASS) is scheduled in two phases for providing regional and global positioning service, respectively. In the first phase, a constellation composed of five Geostationary Earth Orbit (GEO) satellites, five Inclined Geosynchronous Orbit (IGSO) satellites, and four Medium Earth Orbit (MEO) satellites will be deployed by 2012 for providing regional passive navigation service. Then, it will be further expanded into a constellation composed of five GEO satellites and 30 NGSO satellites by 2020 for providing global passive navigation service. And, COMPASS system will provide initial open services by 2013. High precise data processing is the precondition for upgrading navigation precision, monitoring and assessment of GNSS Open services, and expanding the application region for satellite navigation system. Beijing Aerospace Control Center (BACC) is doing the work about operation and maintenance the COMPASS data analysis center, and implements COMPASS orbit determination capability into the newly developed EPOS-RT (Earth Parameter and Orbit determination System in Real-Time) software package which is designed and developed recently at German Research Center for Geosciences (GFZ) for real-time applications. The paper uses the observation data from a network of COMPASS-capable receivers from the IGS Multi-GNSS EXperiment (MGEX) and the Cooperative Network for GIOVE Observation (CONGO) and a regional COMPASS station network operated by China, and adopts the normal IGS and GFZ observation model and dynamic model.The Processing results involve the precise satellite orbit and clock, tracking station coordinate and receiver clock, Zenith Total Delay (ZTD) and Earth Orientation Parameter (EOP) parameters, which can be evaluated by overlaping orbit, comparing the ZTD derived from GPS, and analysing static, kinematic, simulated real-time PPP precision. The preliminary research shows that the processing stragies at BACC is feasible and builds up a good basis for COMPASS data analysis and other scientific research based on COMPASS in the future.