Preface

Recent progresses on Beidou/COMPASS and other global navigation satellite systems (GNSS) – I

The global positioning system (GPS) has been widely used in the navigation, positioning, timing and scientific questions related to precise positioning on Earth’s surface with an unprecedented high accuracy, since it became fully operational in 1994. Recently, the new China’s Beidou navigation satellite system similar in principle to GPS, also called COMPASS, has been developed. At the end of 2012, the Beidou navigation satellite system consisted of 14 satellites, including five geostationary Earth orbit (GEO) satellites, five inclined geosynchronous orbit (IGSO) satellites (two in-orbit spares) and four medium Earth orbit (MEO) satellites. The current service covers China and part of the Asia-Pacific region with positioning accuracy of better than 10 m, velocity accuracy of better than 0.2 m/s and timing accuracy of 50 ns. The Beidou navigation satellite system with global coverage will be completely established by 2020, which will be a constellation of 35 satellites, including five GEO satellites and 30 MEO satellites. The main function of Beidou is the positioning, velocity measurement, one-way and two-way timing and short message communications. Together with the United States’s GPS, Russia’s GLONASS and the European Union’s GALILEO system as well as a number of space-based augmentation systems (SBAS), such as Japan’s quasi-zenith satellite system (QZSS) and India’s regional navigation satellite systems (IRNSS), more opportunities and applications of multi-frequency and multi-system global navigation satellite systems (GNSS) will be exploited and realized in the next decades.

The papers in this issue of Advances in Space Research present the recent development and results of China’s Beidou/COMPASS and other GNSS, including satellite constellations, system tests, receivers, and applications. There was an open call for submissions from the scientific community, and a special call to participants at the 3rd China Satellite Navigation Conference (CSNC 2012) held on May 15–19, 2012, Guangzhou, China. This conference is an open platform for academic exchanges in the field of satellite navigation to encourage technological innovation, accelerate GNSS engineering and boost the development of the satellite navigation industry in China and in the world.

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