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CONSTELLATION DESIGN AND STABILITY PROMOTION APPROACHES FOR COMPASS REGIONAL NAVIGATION SYSTEM

Abstract

The constellation stability design is the key consideration for satellite constellation engineering. An integrated design approach was reviewed for the constellation stability of Compass (Beidou) Regional Navigation and Positioning System (CRNPS) in this paper, the details were presented about the approach how to cater for the navigation precision, common view and geometry configuration requirements, as well as how to budget the constellation assignation and perturbation compensation constraint. Firstly, the constraints and requirements were analyzed for CRNPS constellation stability design; secondly, the constellation's orbital perturbations were summarized dedicated to CRNPS; thirdly, the specific considerations were done for inclined and none-inclined satellites of CRNPS constellation; fourthly, the constellation maintenance specifications for Compass system were worked out. Finally, Real constellation flight orbital data of CRNPS was deployed to ascertain that: the constellation is dynamic stable in line with time and space dimension, the dilution of precision (DOP) is less than 4 within service region, and the Satellite Availability Subject to Configuration Maintenance (SCM-SA) can achieve 99KeyWords: Compass (Beidou) Regional Navigation and Positioning System (CRNPS); Constellation Stability; Orbit Design; Configuration Maintenance.