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SYSTEM DESIGN OF LEO SPACECRAFT POSITION DETERMINATION BASED ON GNSS AND  
GEO DATA BROADCAST SATELLITE

**Abstract**

Space-borne GNSS receivers have become the main method of LEO spacecraft orbit determination. However, due to the accuracy limitation of onboard receivers affected by many error sources, efforts should be made to meet the higher accuracy demand of many remote sensing and other science missions. To enhance the performance of GNSS and increase the precision of position determination, a method is introduced that utilize the global coverage capacity of data broadcast satellite to achieve the goal referencing TRDS Augmentation Service for Satellite. The GNSS data can be processed to eliminate the ionospheric errors and get higher positional accuracy. Then the correction data will be transmitted to LEO spacecrafts with data broadcast satellite to improve positional accuracy. The system structure, configuration, link calculation, performance analysis and other aspects are detailed.