IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Advances in Space-based Navigation Systems, Services, and Applications (7)

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A NAVIGATION ENHANCEMENT TECHNOLOGY BASED ON COMMUNICATION SATELLITE

Abstract

Satellite navigation has the advantages of high accuracy, high continuity and global coverage, and has been widely used in aviation and voyage navigation fields. However, satellite navigation is of great military application value, so in modern high-intensity confrontation, navigation satellites are easy to be targeted. Navigation enhancement technology based on communication satellite can meet the requirements of long-distance high-precision navigation guarantee in aviation and navigation field under the condition of navigation satellite failure. In this paper, a method of high-precision navigation guarantee using communication satellite transponders is proposed. A new type of high-precision, anti-jamming navigation signal is designed. The navigation signal is sent to the communication satellite through the ground signal generation equipment, and then transmitted to the satellite signal receiving equipment by the communication satellite, so as to obtain high-precision ranging information. In this paper, 4-6 GEO communication satellites are used to simulate and analyze the DOP value of satellite positioning in different latitude regions, and the satellite signal receiving equipment is developed. Through actual measurement, the positioning accuracy of 10 meters can be achieved. With the help of conventional aeronautical inertial navigation (gyro bias stability is 0.01 degrees/hour), barometric altimeter and atomic clock, two GEO communication satellites can be used to achieve 20 meters/hour positioning accuracy.