

IAF SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
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RESEARCH ON EVALUATION METHOD OF THE SATELLITE NAVIGATION LANDING SYSTEM
INTEGRITY IN LABORATORY

Abstract

Near the surface of the Earth, the satellite navigation signals are extremely weak and susceptible to interference. In aeronautical applications, the integrity of the satellite navigation signals is very demanding. The concept of integrity of the satellite Navigation Landing System (SNLS) is mainly used to measure the alarm capability of the airborne satellite navigation receiver when its positioning exceeds the alarm threshold. Take the ICAO CAT I request as an example, the integrity risk is not to exceed $2 * 10^{-7}$ / pp. The accurate assessment of SNLS integrity by means of actual test flights in the outfield requires a minimum of 20 years, which has a serious impact on the time to market of satellite navigation landing system products. In order to solve this problem, this paper studies the laboratory testing method of the SNLS integrity. The main factors that affect the SNLS integrity are analyzed. Based on the long-time data collection and data analysis, the fault models that affect the SNLS integrity are established. The fault factors are simulated in the laboratory using simulator, and the SNLS integrity is evaluated in the laboratory. Simulating only integrity risk events in the lab can reduce the SNLS integrity test time from no less than 20 years to no more than 10 days, and effectively reducing the time to market for SNLS products.