Paper ID: 28550
student

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Interactive Presentations (IP)

Author: Ms. Heng Zhang
Shanghai Insitute of Satellite Engineering, China

Mr. Wei Zhang
Shanghai Institute of Satellite Engineering, China
Mr. Xiao Chen
Shanghai Institute of Satellite Engineering, China

RESEARCH ON TIME REGISTRATION METHOD OF CELESTIAL INTEGRATED NAVIGATION SYSTEM FOR DEEP SPACE EXPLORATION

Abstract

Integrated navigation system with high precision for deep space exploration is based on celestial angle and velocity measurement, which has the advantage of continuity, autonomy and real-time. In the process of multisensors' information fusion, synchronized time is required. However, time between celestial angle-measurement sensor and velocity-measurement sensor is non-synchronous caused by time reference error, sampling period inconsistency, data transmission delay etc, which has great impact on position and velocity measurement, Time error in position and velocity estimation of celestial integrated navigation system is analyzed. Based on interpolation-extrapolation method, improved interpolation-extrapolation time registration method according to orbit dynamics is put forward, which resulted in the synchronization of position and velocity navigation information.The simulation results indicated that improved interpolation-extrapolation time registration method could restrain time error effectively, which makes the accuracy of celestial integrated navigation system for deep space exploration increased by 20 percent.