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### 捷联惯导姿态算法中的圆锥误差与量化误差

练军想, 胡德文, 胡小平, 吴文启

国防科技大学 机电工程与自动化学院自动控制系, 湖南 长沙 410073

### Research on Coning Error and Quantization Error of SINS Attitude Algorithm

LIAN Jun-xiang, HU De-wen, HU Xiao-ping, WU Wen-qi

Department of Automatic Control, College of Mechatronics and Automation, National University of Defense Technology, Changsha 410073, China

摘要

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**摘要** 对捷联惯导系统的误差源进行了研究,利用几何方法分析了不可交换性误差和量化误差的形成机理,以及它们的相互影响。针对工程应用中激光陀螺输出脉冲采样量化条件,就多子样算法进行了讨论,并设计了基于MATLAB/Simulink的仿真。研究结果表明,当考虑量化误差的影响时,选取适当的量化因子,三子样等效旋转矢量算法比其它算法具有更好的综合性能。

**关键词:** 捷联惯导 姿态算法 不可交换性误差 量化误差 多子样

**Abstract:** In this paper, the error sources of strapdown inertial navigation system (SINS) are researched. The mechanism of noncommutativity error and quantization error is illustrated from the geometrical point of view, and the mutual influence between them is analyzed. Considering the sample quantizing condition of the output pulses of the ring laser gyroscope (RLG), the multi-sample attitude algorithm of SINS is discussed. The simulation is carried out using MATLAB/Simulink. It is concluded that the three-sample rotation vector algorithm with the proper quantization factor outperforms others when the impact of quantization errors is taken into account.

**Keywords:** SINS attitude algorithm noncommutativity error quantization error multi-sample

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