

控制理论与实践

基于自适应UKF算法的机载INS/GPS空中对准研究

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摘要:

在空中对准失准角不满足小角度假设的条件下, 推导了一种新的机载INS/GPS大失准角空中对准的误差模型。将基于极大似然估计的自适应估计器与无迹卡尔曼滤波(unscented Kalman filter, UKF)算法相结合, 修改自适应滤波算法中自适应参数的表达式。提出将自适应UKF算法用于非线性误差模型的空中对准方案中。仿真表明, 自适应UKF算法能够克服噪声统计模型不准确对滤波结果的影响, 失准角估计的精度好于UKF算法的精度。

关键词: 空中对准 自适应估计 无迹卡尔曼滤波

In-flight alignment research for airborne INS/GPS based on adaptive unscented Kalman filter algorithm

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Abstract:

If there is no small misalignment of in flight alignment any more, an error model of in flight alignment is presented under the condition of large misalignment of airborne INS/GPS. An unscented Kalman filter (UKF) algorithm is developed combined with adaptive estimator based on the maximum likelihood estimation criterion. The simulation shows that the estimation of adaptive UKF is not degraded by the inaccurate statistics characteristic of stochastic information, and has a better performance than that of an unscented Kalman filter.

Keywords: in-flight alignment adaptive estimation unscented Kalman filter

收稿日期 修回日期 网络版发布日期

DOI:

基金项目:

通讯作者:

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作者Email:

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