RESEARCH ON AGRICULTURE SURVEY AND EVALUATION UAV NAVIGATION SYSTEM

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Abstract: Agriculture survey and evaluation UAV is kind of advanced high-efficiency agriculture information equipment that can be used to farmland measurement, agricultural insurance assessments and other fields. BeiDou Navigation Satellite System is China's global navigation satellite system which has been developed independently, and currently it is rarely applied in agriculture survey and evaluation UAV. Since BeiDou navigation system can only provide location information, an integrated navigation system that composed by BeiDou Navigation Satellite System, Strapdown Inertial Navigation System and Air Data System is proposed to improve the navigation accuracy of UAV navigation system. Integrated navigation system model is established, and to improve the navigation system parameters solving speed, and also to overcome the filtering divergence phenomenon caused by the system model uncertainty, a modified two-step adaptive Kalman filter algorithm for navigation parameters solving is proposed. Simulation results show that the proposed integrated navigation system and parameters solving algorithm can effectively improve the UAV navigation accuracy and prevent divergence of the filter.

Keywords: agriculture survey and evaluation; BeiDou navigation satellite system; integrated navigation system; Kalman filter