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INS/CNS INTEGRATED NAVIGATION ALGORITHM USING SMALL FIELD STAR TRACKER FOR
AIRBORNE PLATFORM**Abstract**

In INS/CNS integrated navigation system used by high dynamic airborne platform, small field star tracker can track and observe only one star in one time. It leads to failure of high accuracy celestial navigation algorithm for large field of view star sensor.

Aiming at the problems above, this paper proposes a unified coordinate algorithm base on vector translation technology with time sharing single star observation under dynamic platform. And through the positioning error iterative compensation, the influence of the inertial navigation error on the calculation of astronomy is greatly reduced, and high precision solution is realized with small field star tracker.

This paper first analyzes the characteristics of the small field star tracker in high dynamic airborne platform, and then expounds the specific derivation process of position and azimuth determining algorithm based on small field star tracker, gives the INS/CNS integrated navigation filtering model.

Finally, the high dynamic airborne astronomical observation simulation system and experimental system are established, and the performance of the algorithm is analyzed. Both the simulation and experimental results demonstrate that the algorithm performance is excellent, and has high engineering practical value.