
Real-Time Orbit Determination Technique using Input Estimation Filter Algorithm for Geo-stationary Satellite

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We examined the applying of Input Estimation Filter (IEF) algorithm to the real-time orbit determination for a geo-stationary satellite. Generally, the Extended Kalman Filter (EKF) algorithm has been used to the real-time orbit determination in satellite operation. The EKF algorithm is good for the general non-linear estimation problem and robust to the geo-stationary orbit determination during the non-maneuvering period. But when the orbital maneuvers were occurred, the ordinary EKF shows some large errors. The IEF algorithm has been used to the missile for the tracking of maneuvering target. This algorithm assumes that the target can shows irregular maneuvering motion any time and configures a bank of filters. The filters in the bank generate many possible estimated statuses and compare to the EKF solution, and the best estimated status were adapted and updated finally. In this paper, we are going to show the simulation results of the real-time orbit estimation output using EKF only and with IEF algorithm. Through the comparing the results we could expect that the IEF algorithm can increase the estimation accuracy especially when the north-south stationkeeping maneuver.