

Fault Detection and Isolation in Attitude Control Subsystem of Spacecraft Formation Flying Using Extended Kalman Filters

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Abstract : In this paper, the problem of fault detection and isolation in the attitude control subsystem of spacecraft formation flying is considered. In order to design the fault detection method, an extended Kalman filter is utilized which is a nonlinear stochastic state estimation method. Three fault detection architectures, namely, centralized, decentralized, and semi-decentralized are designed based on the extended Kalman filters. Moreover, the residual generation and threshold selection techniques are proposed for these architectures.

Keywords : component, formation flight of satellites, extended Kalman filter, fault detection and isolation, actuator fault

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