Backstepping fault-tolerant control for a Satlan system with actuator fault

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Abstract: This paper presents the fault tolerant control for a satellite (Satlan system) based on backstepping theory with actuator fault can be modeled by a step signal (additive fault). After dynamic modeling and system state modeling, we presented the technique of the backstepping control. We presented the actuator fault by augmentation in the control of this system. The proposed FTC is able to maintain acceptable performance in the control law and guarantees robustness against uncertainties and external disturbances. A comparative study is made between the proposed fault tolerance control and the PID control technique in the presence of actuator fault. The results obtained show that the proposed FTC has better robustness against actuator fault where the Satlan system operates with acceptable performance.

Keywords: Backstepping technique, Fault tolerant control, PID control, Dynamic modeling, Satlan system.

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RegID: 9944

CERTIFICATE OF PARTICIPATION

This is to certify that

Keltoum Loukal

has participated as **"Face to Face Speaker"** and presented the following paper entitled:

Backstepping fault-tolerant control for a Satlan system with actuator fault

during the

International Conference on Nonlinear Science and Complexity (ICNSC, 2023)

held on July 10-15, 2023
Biruni University
Istanbul-Turkey

INTERNATIONAL CONFERENCE ON NONLINEAR SCIENCE AND COMPLEXITY, 2023
ICNSC
10-15, July 2023
Biruni University
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