

Sensorless Controller of Induction Motor Using Backstepping Approach and Fuzzy MRAS

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Abstract : This paper present a sensorless controller designed by the backstepping approach for the speed control of induction motor. In this strategy of control, we also combined the method Fuzzy MRAS to estimate the rotor speed and the observer type Luenburger to observe Rotor flux. The control model involves a division by the flux variable that may lead to unbounded solutions. Such a risk is avoided by basing the controller design on Lyapunov function that accounts for the model singularity. On the other hand, this mixed method gives better results in Sensorless operation and especially at low speed. The response time at 5% of the flux is 20ms while the error between the speed with sensor and the estimated speed remains in the range of ± 0.8 rad/s for the rated functioning and ± 1.5 rad/s for low speed.

Keywords : backstepping approach, fuzzy logic, induction motor, luenburger observer, sensorless MRAS

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