

Sliding Mode MRAS Observer for Optimized Backstepping Control of Induction Motor

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Abstract : This paper deals with sensorless backstepping control of induction motor using MRAS technique associated to sliding mode approach. A high order genetic algorithm structure is used to approximate a control law designed by the Backstepping technique, and to find the best parameters globally optimized. However, the Backstepping control approach is unsuitable for high performance applications because the need of a speed sensor for increased accuracy and the absence of any error decay mechanism. In this paper a nonlinear observer, obtained by combining sliding mode structure and model reference adaptive system (MRAS), is designed for the rotor flux and rotor speed estimations. To validate the proposed method, the results are presented for showing the improved drive characteristics and performances.

Keywords : Backstepping Control, Induction Motor, Genetic Algorithm, Sliding Mode observer

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020