

## High Performance of Direct Torque and Flux Control of a Double Stator Induction Motor Drive with a Fuzzy Stator Resistance Estimator

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**Abstract :** In order to have stable and high performance of direct torque and flux control (DTFC) of double star induction motor drive (DSIM), proper on-line adaptation of the stator resistance is very important. This is inevitably due to the variation of the stator resistance during operating conditions, which introduces error in estimated flux position and the magnitude of the stator flux. Error in the estimated stator flux deteriorates the performance of the DTFC drive. Also, the effect of error in estimation is very important especially at low speed. Due to this, our aim is to overcome the sensitivity of the DTFC to the stator resistance variation by proposing on-line fuzzy estimation stator resistance. The fuzzy estimation method is based on an on-line stator resistance correction through the variations of the stator current estimation error and its variations. The fuzzy logic controller gives the future stator resistance increment at the output. The main advantage of the suggested algorithm control is to avoid the drive instability that may occur in certain situations and ensure the tracking of the actual stator resistance. The validity of the technique and the improvement of the whole system performance are proved by the results.

**Keywords :** direct torque control, dual stator induction motor, Fuzzy Logic estimation, stator resistance adaptation

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