7. A Study on the Improvement of Control Characteristics of Induction Motor using Parameter Adaptive Identification

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Vector controlled induction motor have been widely used in high performance applications. However, the performance is sensitive to the variations of motor parameters, especially the rotor time constant which varies with the temperature and the saturation of the magnetizing inductance.

In this paper the authors propose new identifying method for time-varying parameters of an induction motor which is based on adaptive vector control with serial block algorithm. Recursive algorithm is adapted to estimate parameters of the vector controlled induction motor based on measurements of the stator voltage, currents and slip frequency. Due to its recursive structure, this algorithm has the potential to be used for on-line estimation and adaptive control. The algorithm is designed using regression model derived from the motor electrical equation. This model is valid when there is a time-scale separation between vector control system and adaptive system. Vector control performed at fast stage and slow stage is in charge of parameters estimation. The performance of the algorithm is illustrated by means of simulation and