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INPUT-OUTPUT LINEARIZED CONTROL FOR SPACE VECTOR MODULATED DTC OF INDUCTION MOTOR

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Abstract

This paper presents feedback linearized design of Space Vector Modulated Direct Torque Control (SVM-DTC) of 3-phase VSI-fed Induction Motor. Induction motor is inherently nonlinear and hence difficult to control. Nonlinearities in the motor model make the control of induction motor a challenging problem. Various intelligent and modern controllers have been designed for SVM-DTC to track the performance with dynamically changing situations and presence of uncertainties. These control algorithms require tuning of parameters to achieve desired response and have typical shortcomings. e.g. sliding mode control (SMC) has chattering problem, fuzzy control (FC) has tuning difficulties etc. An altogether different approach towards the design of the controller using exact input-output decoupling and linearization via a feedback linearization can be achieved. Feedback linearization is achieved by exact state transformation. First, the state variable transformation is done via feedback linearization to obtain linearized states variables and then in order to track desired reference signals of torque and stator flux, the input stator voltage vectors are designed using linear state feedback law.

Keywords: Input-Output Linearised Control**,** Direct Torque Control, Space Vector Modulation