

Vector Controlled Induction Motor Drive

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Abstract: An induction motor is a versatile industrial drive. Among the industrial drives used, 70% are asynchronous drives. Control of these drives is an important aspect. Vector Control (VC) technique is an excellent control strategy to control torque in an induction motor. It is also called, "Direct Field Orientation (IFO) Asynchronous Drives". These drives are increasingly employed in industry. The performance of VC drives often degrades. Induction motor works on best performance at certain voltage and frequency for certain loads. When the load torque and speed changes. Thus, the efficiency of the induction motor is increased. Due to the dynamics of induction motor (IM) control, which are multivariable, highly nonlinear, and time-varying, as well as the lack of measurements, this is a challenging and complex engineering problem. This work develops and analyzes vector control for three-phase squirrel cage induction motor speed control. The current method forgoes the usage of flux and speed sensors, resulting in a reduction in mechanical cost and robustness. The dynamic control efficiency of motors has substantially improved because to the use of vector control in place of conventional control methods such as employing the voltage to frequency ratio as a constant.

Keywords: Field Oriented Control (FOC), PI, Squirrel Cage Induction Motor, Vector Control

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