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短文

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基于重置算法的感应电机转速自适应观测器

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Rotor flux and speed adaptive observer for induction motor based on a reset law

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摘要

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摘要

常规并联双模型转速自适应观测器在电机启动、加速或突加负载时存在观测转速滞后性大、精度低的问题,使得感应电机无速度传感器控制系统的调速性能变差。针对上述问题,提出一种重置自适应转速观测器对转子磁链进行观测,同时通过自适应机构得到电机转速,并利用Lyapunov稳定性定理证明了系统的稳定性。仿真和实验结果表明,所提出的重置自适应观测器的观测误差小、稳定性好,改善了在电机启动、加速或突加负载时的转速观测性能。

关键词: 无传感器技术, 重置算法, 自适应观测器, 并联双模型

Abstract:

The conventional parallel dual model speed adaptive observer has the problem of large delay and low precision when the motor gets started or a sudden load applied. The problems produce a bad effect on the speed control performance of the speed sensorless control system of the induction motor. To deal with the above problems, a reset adaptive observer is proposed to observe the rotor flux, then the rotor speed is obtained from an adaptive mechanism at the same time. And the stability of the system is proved by using the Lyapunov stability theorem. The simulation and experiment results show that, the proposed observer has high precision and good stability, and improves the speed observation performance, especially when the motor gets started or a sudden load applied.

Key words: sensorless technology reset law adaptive observer parallel dual model

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