

Using of Particle Swarm Optimization for Loss Minimization of Vector-Controlled Induction Motors

Authors : V. Rashtchi, H. Bizhani, F. R. Tatari

Abstract : This paper presents a new online loss minimization for an induction motor drive. Among the many loss minimization algorithms (LMAs) for an induction motor, a particle swarm optimization (PSO) has the advantages of fast response and high accuracy. However, the performance of the PSO and other optimization algorithms depend on the accuracy of the modeling of the motor drive and losses. In the development of the loss model, there is always a trade off between accuracy and complexity. This paper presents a new online optimization to determine an optimum flux level for the efficiency optimization of the vector-controlled induction motor drive. An induction motor (IM) model in d-q coordinates is referenced to the rotor magnetizing current. This transformation results in no leakage inductance on the rotor side, thus the decomposition into d-q components in the steady-state motor model can be utilized in deriving the motor loss model. The suggested algorithm is simple for implementation.

Keywords : induction machine, loss minimization, magnetizing current, particle swarm optimization

Conference Title : ICECECE 2014 : International Conference on Electrical, Computer, Electronics and Communication Engineering

Conference Location : Paris, France

Conference Dates : November 21-22, 2014