Abstract

This paper presents two methods for designing special purpose controllers for permanent magnet synchronous motor. The main target of the designed controllers is to reduce torque ripples of this type of motors. The first proposed adaptive method is based on two loop controllers (current controller and speed controller) in addition to using space vector pulse width modulation to maximize fundamental component of torque. The second proposed method is based on PI current controllers enabling tracking of quadrature current command values. Simulation results of the suggested adaptive controller are compared with that of the PI controller. Comparative analysis proves the effectiveness of the suggested adaptive controller than the classical PI one according to ripple reduction as well as dynamic response. Moreover, the suggested adaptive controller when compared with other controllers shows great success in
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torque ripples reduction, enabling speed tracking while minimizing the torque ripple.

References

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Index Terms

Computer Science Control Systems

Keywords

Model reference adaptive system PM synchronous motor torque control