



Sensorless Two Series Connected Quasi Six-Phase IM Based Direct Torque Control for Torque Ripples Minimization

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Abstract: In this paper, a new direct torque control (DTC) is proposed for a two series connected quasi six-phase induction motor (IM) with sinusoidal distributed windings fed by a single six-phase voltage source inverter (VSI). The developed DTC control is reformulated as a variable structure control strategy characterized by its simplicity, fast response and robustness to motor parameter variations. Indeed, the proposed DTC controller accomplishes two tasks, first it guarantees a decoupled torque/flux control for each machine while imposing separate control loops, the second is to eliminate current circulation that appears in stator windings of each machine through the usage of appropriate vector maps in $(\alpha - \beta)$ and $(x - y)$ plan. The effectiveness and the robustness of the proposed method are shown by computer simulation.

Keywords: *direct torque control; voltage source inverter; two series connected quasi six-phase induction motor drive.*

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