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Summary; Reference; Problems; 3 : Dynamic Analysis of Induction Machines in Terms of dq Windings; 3-1 Introduction; 3-2 dq Winding Representation; 3-2-1 Stator dq Winding Representation; 3-2-2 Rotor dq Windings (Along the Same dq-Axes as in the Stator); 3-2-3 Mutual Inductance between dq Windings on the Stator and the Rotor; 3-3 Mathematical Relationships of the dq Windings (at an Arbitrary Speed d)
3-3-1 Relating dq Winding Variables to Phase Winding Variables 3-3-2 Flux Linkages of dq Windings in Terms of Their Currents; 3-3-3 dq Winding Voltage Equations; 3-3-4 Obtaining Fluxes and Currents with Voltages as Inputs; 3-4 Choice of the dq Winding Speed d; 3-5 Electromagnetic Torque; 3-5-1 Torque on the Rotor d-Axis Winding; 3-5-2 Torque on the Rotor q-Axis Winding; 3-5-3 Net Electromagnetic Torque Tem on the Rotor; 3-6 Electrodynamics; 3-7 d- and q-axis Equivalent Circuits
3-8 Relationship between the dq Windings and the Per-Phase Phasor-Domain Equivalent Circuit in Balanced Sinusoidal Steady State3-9 Computer Simulation; 3-9-1 Calculation of Initial Conditions; 3-10 Summary; Reference; Problems; 4: Vector Control of Induction-Motor Drives: A Qualitative Examination; 4-1 Introduction; 4-2 Emulation of dc and Brushless dc Drive Performance; 4-2-1 Vector Control of Induction-Motor Drives; 4-3 Analogy to a Current-Excited Transformer with a Shorted Secondary; 4-3-1 Using the Transformer Equivalent Circuit; 4-4 d- and q-Axis Winding Representation
4-5 Vector Control with d-Axis Aligned with the Rotor Flux

Sommario/riassunto

Advanced Electric Drives utilizes a physics-based approach to explain the fundamental concepts of modern electric drive control and its operation under dynamic conditions. Gives readers a "physical" picture of electric machines and drives without resorting to mathematical transformations for easy visualization Confirms the physics-based analysis of electric drives mathematically Provides readers with an analysis of electric machines in a way that can be easily interfaced to common power electronic converters and controlled using any control scheme Makes the MATLAB/S