Theorems of torque coefficients on stability of induction and reluctance machines

Abstract

Theoretical work has been developed for establishing stability characteristics of the damping and synchronizing torque coefficients, and five theorems are formulated and proved analytically in this paper. These are applied to the simple poly-phase induction machine and synchronous reluctance machine. The proofs depend on the characteristics of D-decomposition diagram, power/frequency relation in small-signal stability, and eigenvalue loci. The theorems are developed for all ranges of working and not working conditions and examples for those applications are given.