

This paper presents robustness evaluation of deadbeat-direct torque and flux control (DB-DTFC) of interior permanent-magnet synchronous machine (IPMSM) drives with respect to machine parameter variation. For performance comparison, current vector control (CVC), one of the most widely used control methods, is also implemented under identical operating conditions as DB-DTFC. As the metrics to evaluate dynamic performance of DB-DTFC and CVC IPMSM drives, command tracking is used to investigate torque command tracking performance and dynamics stiffness is used to evaluate disturbance rejection performance. In addition, the torque estimation accuracy of DB-DTFC and CVC is investigated with respect to parameter variation. Simulation and experimental results of robustness evaluation of DB-DTFC and CVC are presented in this paper.