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RESEARCH ARTICLE



Field Oriented Control of Permanent Magnet Synchronous Motor

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Abstract-Today, “electric platform” based commercial and military aerospace, land vehicles and weapon systems are using adjustable speed PM motor systems to replace older fixed speed motors that have mechanical gearboxes. PMSM (Permanent Magnetic Synchronous Motor) has been increasingly used in many high performance application due to its advantages of high power density, high power factor and efficiency. Firstly, a SVPWM scheme, vector control method and fuzzy controller are derived and applied in the speed control IC of PMSM drive. Secondly, the Very-High-Speed IC Hardware Description Language (VHDL) is adopted to describe the behavior of the fore mentioned control algorithms. Vector control techniques have made possible the application of PMSM motors for high performance applications where traditionally only dc drives were applied. PMSM torque control has traditionally been achieved using Field Oriented Control (FOC).

Keywords: FOC; PMSM; SVPWM; VHDL; vector control

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