

## Abstract Details

**Title:** Hybrid Pi-Fuzzy Speed Controller for Interior Permanent Magnet Synchrono

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**Abstract:** The AC machine drives are becoming more and more popular, specifically the Induction Motors and Permanent Magnet Synchronous Motor (PMSM), but the PMSM drives are meeting the requirements with a fast dynamic response, high power factor and wide operating speed range in high performance applications. Some of the PMSM advantages include high efficiency, small volume, high power density, fast dynamics, large torque to inertia ratio, and low maintenance costs. Their applications are found in machine tools, servo and robots, in textile machines, electric vehicle etc. In a permanent magnet synchronous motor, the dc field winding of the rotor has been replaced by a permanent magnet to produce the air-gap magnetic field. By putting the magnets on the rotor, some of the electrical losses due to the field windings get reduced and the absence of the field losses improve the thermal characteristics of the Permanent Magnet machines along with its efficiency. The lack of some mechanical components such as brushes and slip rings makes the motor much lighter, high power to weight ratio which assures a higher efficiency and reliability. The permanent magnet synchronous generator is a viable solution for wind turbine applications as well. PM machines also have some disadvantages, at high temperature, the magnet gets demagnetized, difficulties to manufacture and high cost of PM material.

**Keywords:** Interior Permanent Magnet, PMSM, Hybrid Pi-Fuzzy.