

**Abstract**

This paper presents a robust control based on fuzzy logic and sliding mode for the speed regulation of a Dual Star Induction Machine (DSIM), supplied by two PWM voltage source inverter (VSI) by means of Photovoltaic Generator using a maximum power point tracking (MPPT) control, and decoupled by Field Oriented Control (FOC). However, the principal drawback of sliding mode is the Chattering effect which characterized by torque ripple, this phenomena is undesirable and harmful for the machines, it generates noises and additional forces of torsion on the machine shaft. In order to reduce the Chattering effect, the Sign function of sliding mode controller discontinuous part is replaced by a fuzzy logic function; we will have the fuzzy sliding mode controller (FSMC). The simulation results show that the proposed method is insensitive to parameter variations (rotor resistance, inertia) and load disturbances; it has very interesting dynamic performances (fast response without overtaking and fast speed inversion time). The FSMC makes it possible to combine the performances of the two types of controllers (SMC and FLC) and eliminates the Chattering effect.