



Dual Star Induction Motor Supplied with Double Photovoltaic Panels Based on Fuzzy Logic Type-2

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Abstract: Production of electrical energy is carried out mainly from fossil fuels and nuclear fuel. The excessive consumption of these energies during the 20th century has led to an aggravated pollution of the atmosphere. Since this form of energy covers most of the current energy production, it is necessary to find alternative solutions. The constraint is therefore to have an economical and sustainable source of energy, since environmental protection has also become a very important point. Several studies have been carried out in the field of renewable energies, such as photovoltaic energy, it has gained a lot of attention in recent years because it is environmentally friendly and sustainable compared to traditional energy sources. We can consider also the direct torque control (DTC) as an alternative to conventional methods of control by pulse width modulation (PWM) and by field oriented control (FOC), the direct torque control (DTC) found by Takahashi offers high performance in terms of simplicity in control and fast electromagnetic torque response. With dominant characteristics, the direct torque control for AC electric motor drive supplied by a solar energy is alternative in industrial applications. This paper discusses and presents the application of direct torque control (DTC) in open and closed loop, using voltage source inverter to control motor torque and flux with maximum power point tracking in weather conditions and load variation.

The P&O MPPT algorithm is mostly used, due to its ease of implementation, however, this MPPT algorithm gives us more torque ripples mainly with load variation. To resolve this problem, we will propose in this paper a fuzzy logic type-2 technique to replace the first one (P&O).

Keywords: *DTC; DSIM; Photovoltaic (PV) array; MPPT; DC/DC converter; P&O; FLC type-2.*

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