

Testing of classical MPPT techniques using Proteus model of PV system



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ABSTRACT – Maximum power point tracking allows to extract the maximum of power whatever the operating meteorological conditions. Recently, many maximum power point tracking MPPT techniques have been proposed and developed to achieve maximum produced energy. In this paper, Proteus model of peak power tracking system of PV panel is used to test classical techniques, such as P&O, P&O Adaptive and Incremental Conduct under different climatic conditions. The simulator offers a high degree of control and planning of many simulated event. The overall objective of paper is to test the robustness, speed and accuracy of these classical techniques. The theoretical operation confirms the high performance of Proteus model.

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In this work, the robustness of three classical technics as P&O, P&O adaptive and Incremental Conductance IC at STC conditions and under solar varying has been tested.

The program in language C is implemented in the microprocessor PIC which provides the signal. The PIC calculates the solar watts generated by reading the voltage and current of the solar panels.

Results and Discussion –

• Under Standard Test Conditions (STC)

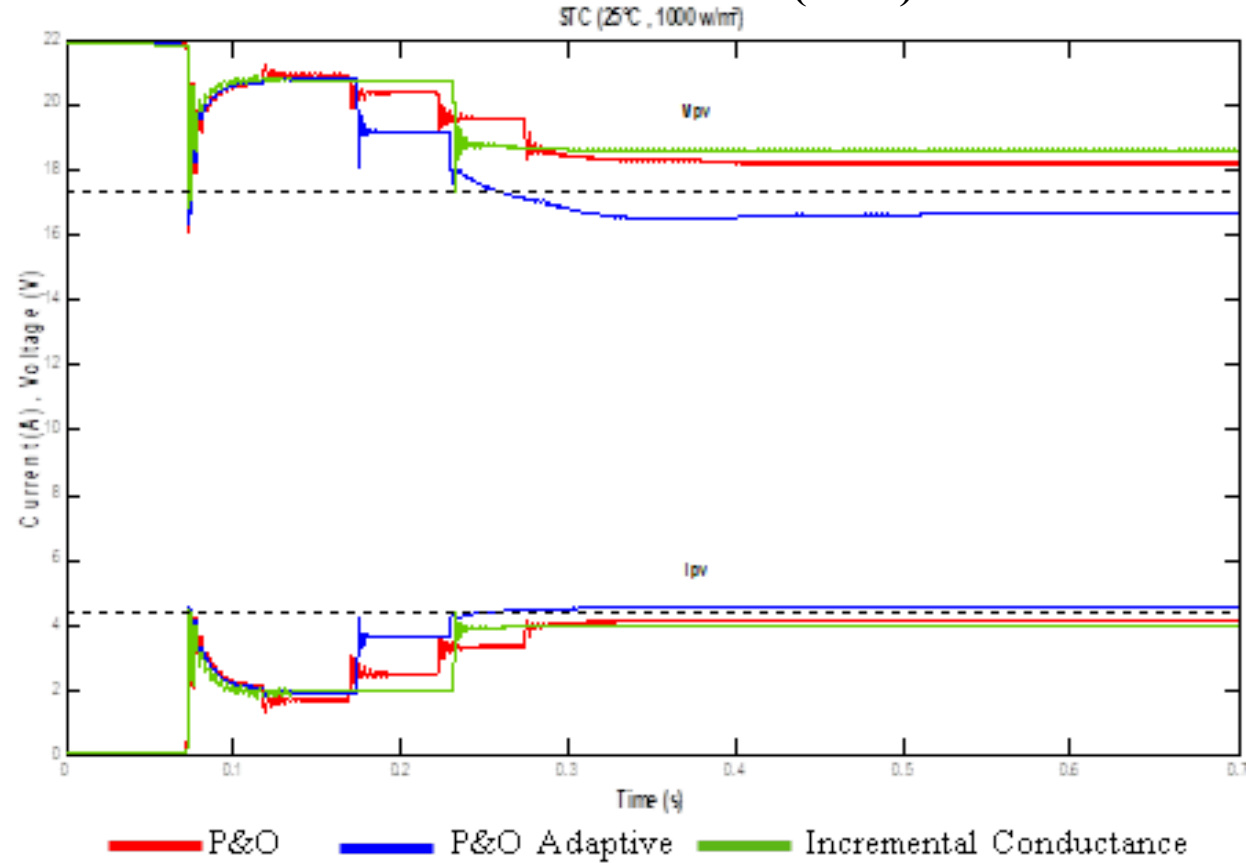


Fig. 2. Tracking Voltage $V(t)$ and Current $I(t)$ at STC.

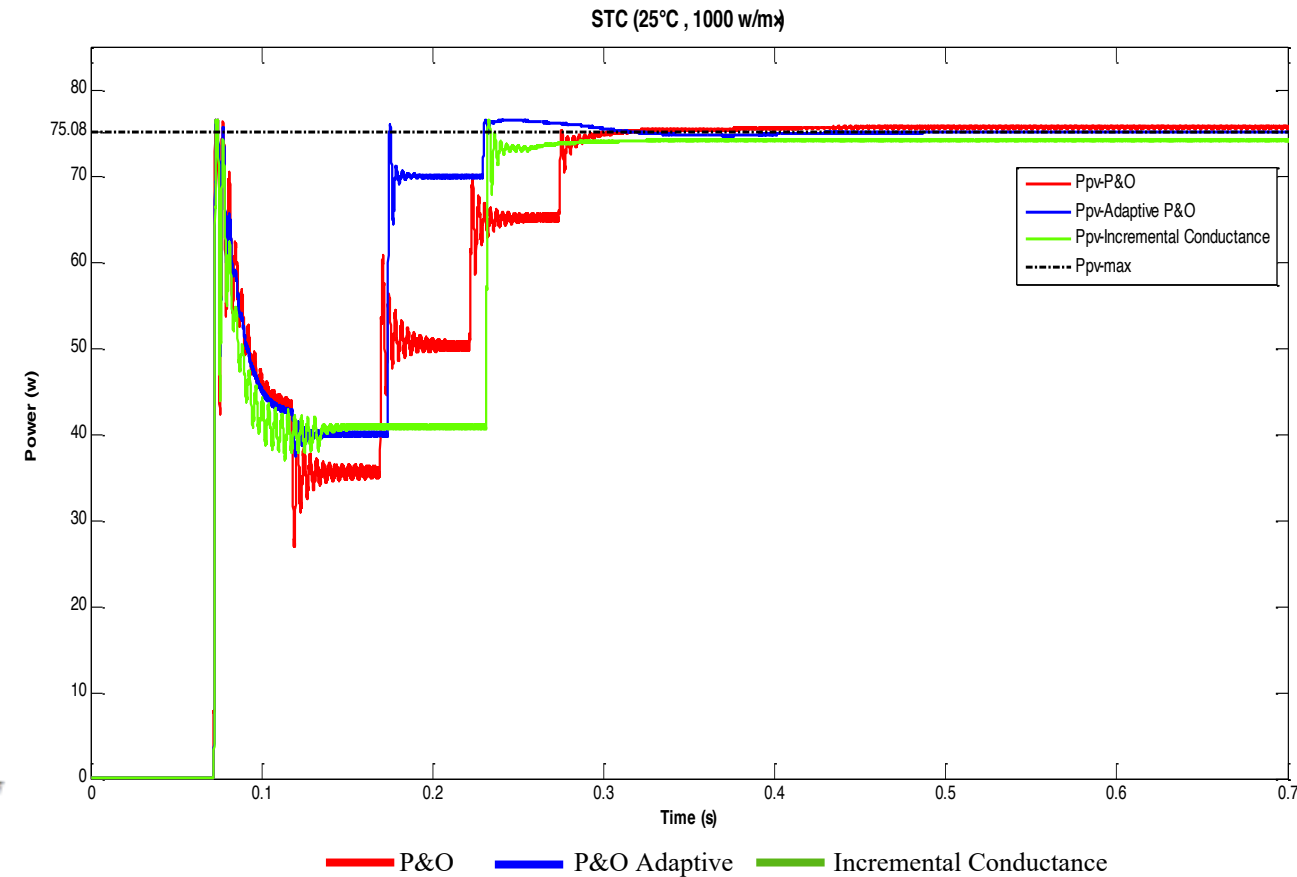


Fig. 3. Tracking Power $P(t)$ at STC.

• Under Varying Solar Irradiation Levels

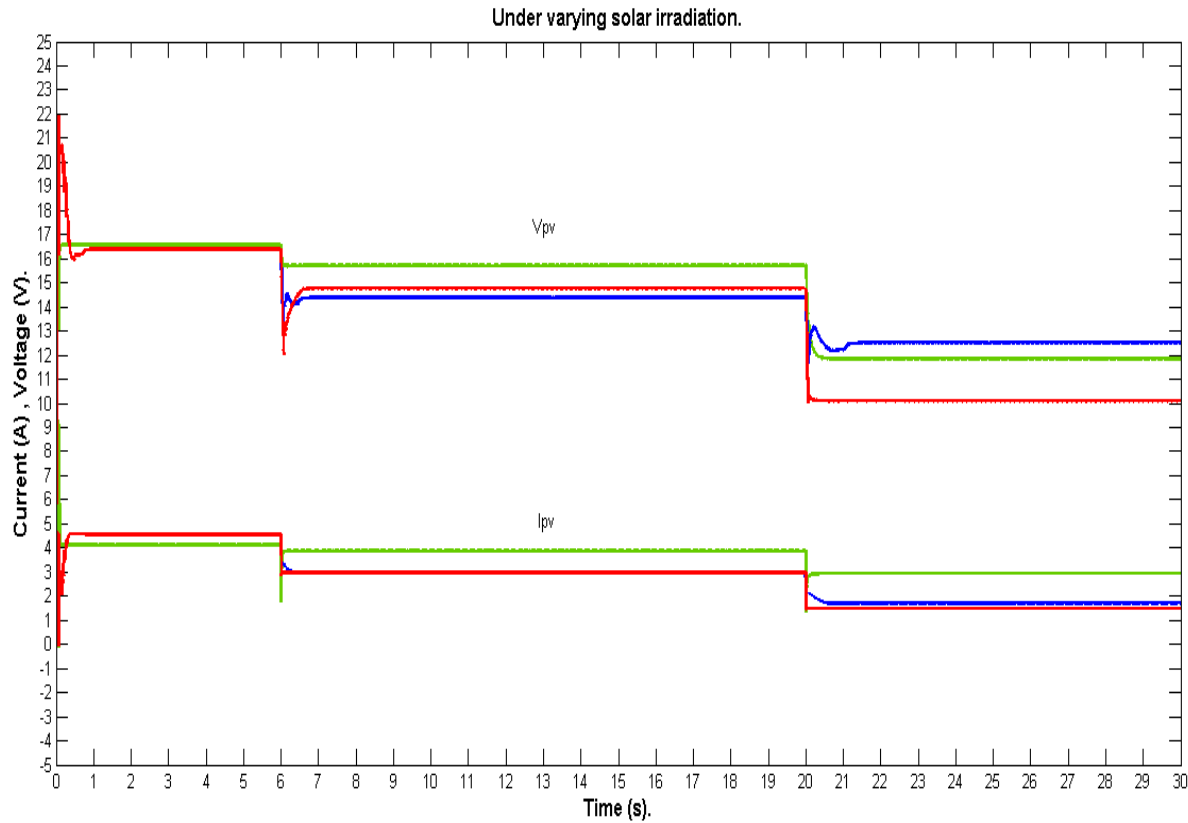


Fig. 4. Tracking Voltage $V(t)$ and Current $I(t)$ under varying solar irradiation.

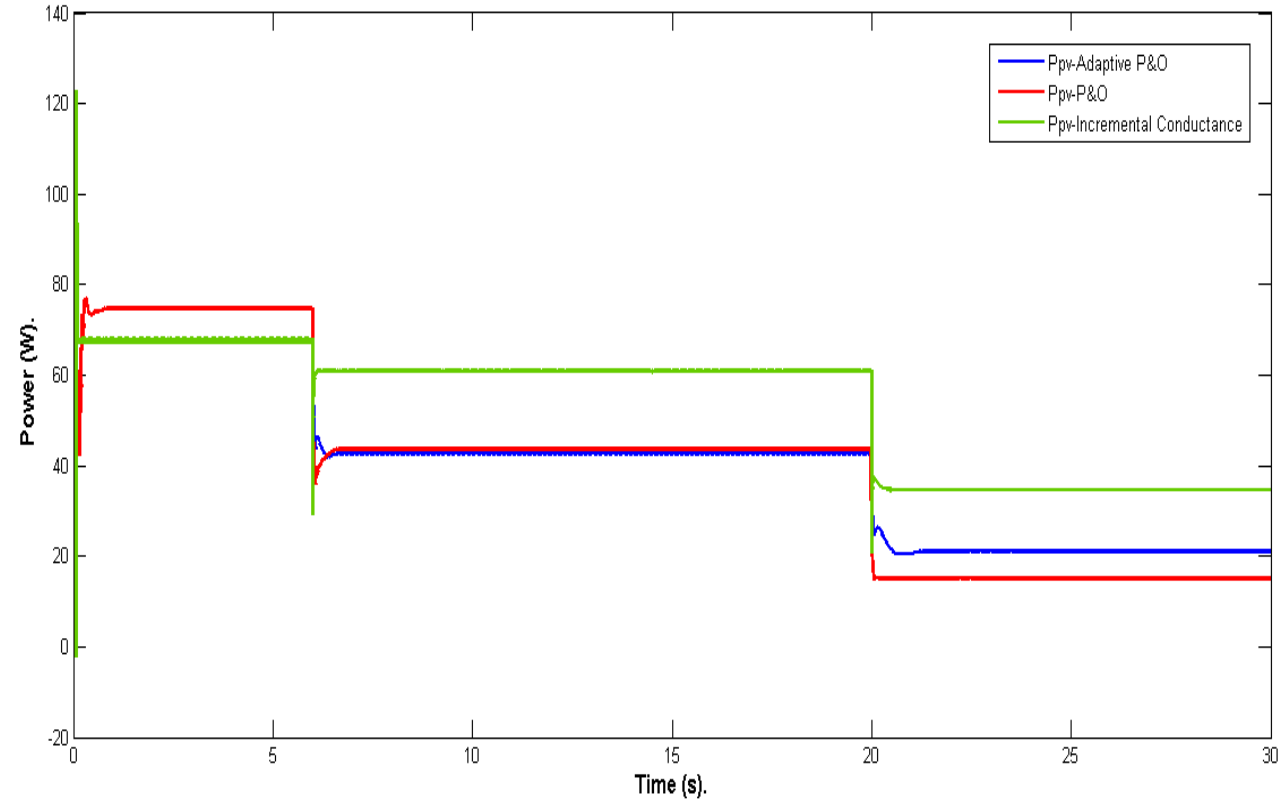


Fig. 5. Tracking Power $P(t)$ under varying solar irradiation.

The results of this study are discussed in order to contribute to a better comprehension of peak power tracking in Proteus model at Standard Test Conditions (STC) and under varying solar irradiation.

The incremental conduct technique offers high performance even under solar irradiation varying levels. On the other hand, results of P&O and P&O adaptive show a significant loss of energy and slow tracking in the case of under varying solar irradiation levels .

Conclusion –

- **The overall objective of paper is to test the robustness, speed and accuracy of these classical techniques.**
- **The results obtained from simulation using ISIS Proteus software confirm the superior performance of the Proteus model.**
- **Proteus model helps researchers and professional to achieve the required physical prototype of PV system.**
- **The Proteus simulator gives a proper idea on the code and circuit before implementing on hardware.**

Thank You For Your Attention !