Photovoltaic Cell Analysis for PandO and InC based DC Motor Control

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Abstract- The idea of Maximum Power Point Tracking is to be executed which brings about calculable increment in the productivity of the Photovoltaic System. Diverse plans of MPPT calculations, for example, Perturb and Observe, Neural Network are to be examined and executed. The MPPT calculation therefore proposed will recognize the reasonable duty ratio in which the DC/DC converter ought to be worked to get most extreme power yield. The advantage of this theory is to offer access to an everlasting and contamination free use of energy. In this thesis, analysis is prepared by InC and PandO techniques for DC motor analysis, the THD is improved by 27.1%.

Keywords- MPPT, PV, PandO, InC, DC Motor

I. INTRODUCTION

Basically the Maximum power point (MPP) of a photovoltaic exhibit is a basic phase of a SOLAR framework [7] [8]. In that capacity, numerous MPPT techniques have been presented and various variations of every strategy have been proposed to defeat particular drawbacks. The substantial number of strategies proposed can make it hard to decide the best strategy to embrace while actualizing a SOLAR framework. The strategies all fluctuate in intricacy, number of sensors required, computerized or simple execution, joining radiation, following capacity, and cost viability. [4][5]Moreover, the kind of utilization can significantly affect the determination of MPPT calculation. Hence, this paper condenses the most mainstream MPPT strategies being used today. Two promising techniques are then featured for consideration while actualizing a framework which needs to adapt well finished an extensive variety of irradiance conditions.[3]

Proposed Methodology & Simulation Results

In P&O strategy, the MPPT calculation depends on the count of the SOLAR yield control and the power change by inspecting both the SOLAR current and voltage. The tracker works by occasionally augmenting or decrementing the solar exhibit voltage. In the event that a given annoyance prompts an expansion (diminish) in the yield intensity of the SOLAR, at that point the consequent bother is created in the same (inverse) heading. Along these lines, the duty cycle of the dc chopper is changed and the procedure is rehashed until the point that the most extreme power point has been come to. As a matter of fact, the framework wavers about the MPP. Diminishing the bother step size can limit the swaying. [1][2]

Notwithstanding, the P&O technique can bomb under quickly changing air conditions. A few research exercises have been completed to enhance the conventional Hill-climbing and P&O Methods. Reference [5] proposes a two phase calculation that offers speedier following in the main stage and better following in the second stage. To keep disparity from MPP, adjusted versatile calculation is proposed in [6].

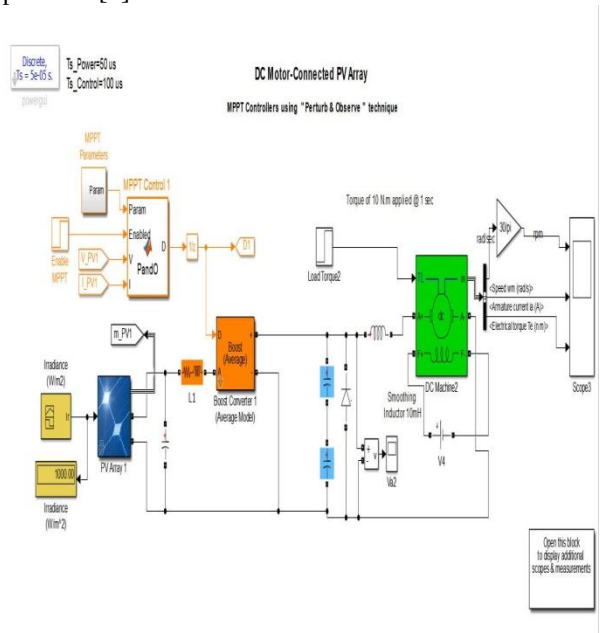

Fig.1: PV connected DC motor PandO method

In the figure 1, PV connected DC motor is implemented with PandO method. FFT analysis of the output speed shown in figure 2.

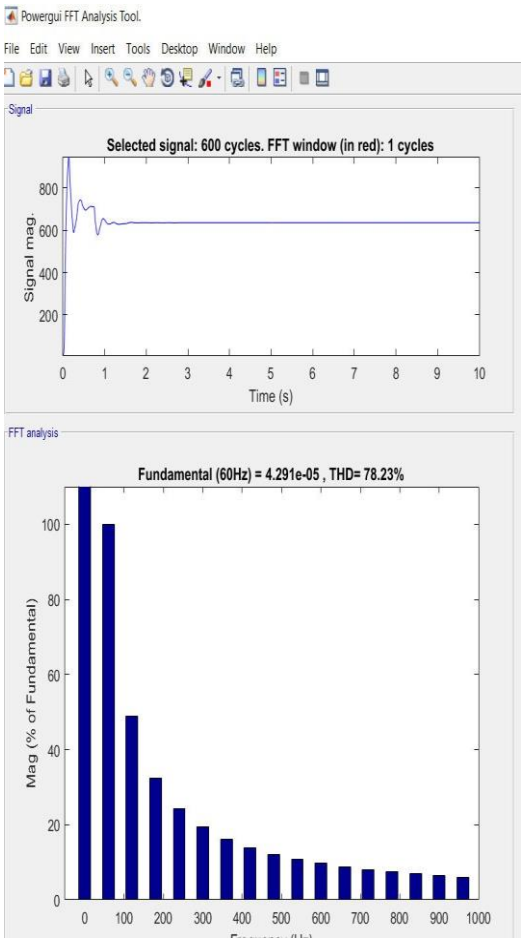

Fig.2: Output waveform of PV PandO DC motor and FFT Analysis

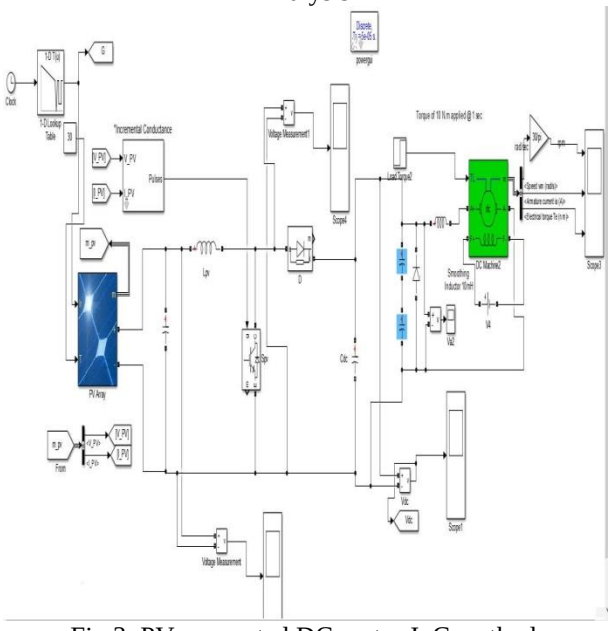

Fig:3: PV connected DC motor InC method

In the figure 3, PV connected DC motor is implemented with InC method. Output Waveform and FFT analysis of the output speed shown in figure 4.

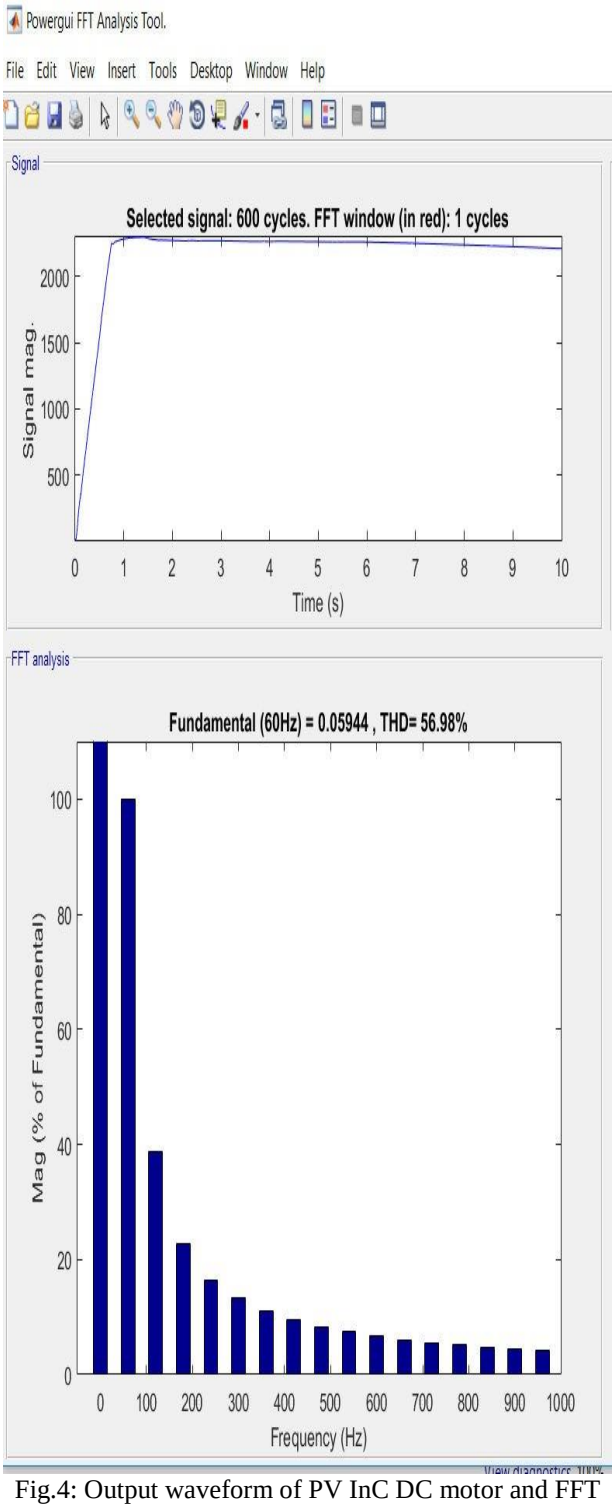

Fig.4: Output waveform of PV InC DC motor and FFT Analysis

II. CONCLUSION

From the results, it is clear that when using DC motor application InC that is incremental conductance technique for MPPT is better than PandO DC motor MPPT technique. From the FFT analysis, the improvement percentage is 27.1% in THD that is total harmonic distortion level in speed of the DC motor.

III. REFERENCES

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