

1. Summary

1.1 Motivation/purpose/aims/hypothesis:

The hypothesis here, as per the authors is that output power of the solar PV system will change when the input variables changes. How much effect different inputs will have on the output, is questioned. Various details are discussed in sections below.

1.2 Contribution

This research done by the authors shed light on efficiency, maximum power and effects of inputs of the PV module. The authors have done a phenomenal job with the paper. Have discussed many factors in great detail. Used mathematical model and equations to explain details of the model. Research contributes a great deal to modelling, validation and simulation of Solar PV modules.

1.3 Methodology

Authors use the double diode model equivalent circuit using MATLAB and then finds the parameters using the Newton-Raphson method. Three I-V characteristics were considered - maximum power, open circuit voltage, and short circuit current. The module was tested in different conditions. To validate the results predicted performance is compared with actual data of KYOCERA KC125GT solar PV module. Performance was evaluated using statistical error tests such as root mean square error, RMSE, and correlation coefficient, R2. The performance of the predicted model used for simulation of the effect of variation of environmental factors such as solar radiation and temperature, and physical parameters such as series and parallel resistances.

1.4 Conclusion

The simulation results show that the increase in solar radiation will result in an increase in harvested power, and the increase in temperature will result in a decrease in harvested power. Various points are made in the conclusion of the paper, where each factor increases or decreases harvested power. Authors also state in various comparison graphs how much harvested power will be gained or lost on each specific change.

2 Limitations

2.1 First Limitation/Critique

Only one 3d visualization graph is utilized, more 3d graphs would have given much clearer pictures and more depth to this deep research. Also, 3d graphs can be bar graphs or pie-charts. It would provide more visualizations of the other factors to output power and efficiency.

2.2 Second Limitation/Critique

Only one method and model used to mathematically calculate and design model. Other designs might have given greater perspectives and more varying degrees of research.

3 Synthesis / Future Scopes

Promotes comparative research on PV modules. Newer models with more details can come about.