Solar Photovoltaic Powered Sailing Boat Using Buck Converter

ABSTRACT

The main objective of this paper is to establish technical and economical aspects of the application of stand-alone photovoltaic (PV) system in sailing boat using a buck converter in order to enhance the power generation and also to minimize the cost. Performance and control of dc-dc converter, suitable for photovoltaic (PV) applications, is presented here. A buck converter is employed here which extracts complete power from the PV source and feeds into the dc load. The power, which is fed into the load, is sufficient to drive a boat. With the help of matlab simulink software PV module and buck model has been designed and simulated and also compared with theoretical predictions.

KEYWORDS

1. Buck Converter
2. Ideal Switch
3. Matlab Simulink
4. PV
5. Solar Sailing Boat

SOFTWARE: MATLAB/SIMULINK
BLOCK DIAGRAM

Figure 1. Schematic Diagram of PV powered Sailing Boat

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EXPECTED SIMULATION RESULTS

Figure 2. Simulation result of maximum voltage, current and power in PV array

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Figure 3. Simulation result of Buck converter

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Figure 4. Simulation result of PV with Buck

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CONCLUSION
Solar PV powered sailing boat using buck converter is proposed here. The effectiveness of the proposed control scheme is tested. This is a new and innovative application which is fully environmental friendly and is almost pollution less. As the upper portion of the boat is unused, solar panels are implemented in that portion quite easily, no extra space is required. Fuel cost is not required in day time due to the presence of sunlight. Lastly, energy pay back period will be lesser than diesel run boat.

REFERENCES