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NH-16, Anakapalle, Visakhapatnam-531002, Andhra Pradesh.

(IOTDA-2K21)

17-18 Dec, 2021

**Department of Computer Science & Engineering
and Electronics & Communication Engineering**

Proceedings of Two Day Online National Conference on Internet of Things : Design & Applications

Sponsored by



Chief Patron : Sri Dadi Ratnakar, Chairman

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Conference Website Link

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Solar Powered BLDC Motor with HCC Fed Water Pumpin System for Irrigation

¹J. Deleep Kumar, ² S. Sai Kumar

¹ Assistant Professor, Department of Electrical and Electronics Engineering,

² P.G Student, Department of Electrical and Electronics Engineering,

¹jdkumar@diet.edu.in

Abstract: This paper deals with the BLDC motor drive powered from solar photovoltaic system with HCC fed water pumping system for irrigation. BLDC motor is preferred over other brush-based motors for its unique features like high efficiency, high torque and simple structure with low noise. By using conventional control strategies torque ripples are present, by introducing Hysteresis Current Control (HCC) torque ripple can be minimized. As solar power is abundant and available at any place so the solar photovoltaic (SPV) array system is considered as the source. The modified incremental conductance maximum power point technique is used because of its advantage of providing soft starting to BLDC motor. The main objective of this paper is to minimize the torque ripples occurring in BLDC motor drive using Hysteresis Current Control, which is simulated using MATLAB/SIMULINK platform.

KEYWORDS: Solar Photo Voltaic Array, BLDC Motor, Buck-Boost DC-DC Converter, Voltage source inverter, Hysteresis Current Controller.