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BLDC Motor Driven for Solar Photo Voltaic Powered Air Cooling System

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Abstract : Solar photovoltaic (SPV) power systems can be employed as electrical power sources to meet the daily residential energy needs of rural areas that have no access to grid systems. In view of this, a standalone SPV powered air cooling system is proposed in this paper, which constitutes a dc-dc boost converter, two voltage source inverters (VSI) connected to two brushless dc (BLDC) motors which are coupled to a centrifugal water pump and a fan blower. A simple and efficient Maximum Power Point Tracking (MPPT) technique based on Silver Mean Method (SMM) is utilized in this paper. The air cooling system is developed and simulated using the MATLAB / Simulink environment considering the dynamic and steady state variation in the solar irradiance.

Keywords : boost converter, solar photovoltaic array, voltage source inverter, brushless DC motor, solar irradiance, maximum power point tracking, silver mean method
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