

Numerical Simulation of a Solar Photovoltaic Panel Cooled by a Forced Air System

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Abstract : This study focuses on the cooling of a photovoltaic panel (PV). Indeed, the cooling improves the conversion capacity of this one and maintains, under extreme conditions of air temperature, the panel temperature at an appreciable level which avoids the altering. To do this, a fan provides forced circulation of air. Because the fan is supplied by the panel, it is necessary to determine the optimum operating point that unites efficiency of the PV with the consumption of the fan. For this matter, numerical simulations are performed at varying mass flow rates of air, under two extreme air temperatures (50°C, 25°C) and a fixed solar radiation (1000 W.m²) in a case of no wind.

Keywords : energy conversion, efficiency, balance energy, solar cell

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