

SPECIFIC APPLICATIONS: HEAT DISSIPATION IN PHOTOVOLTAIC SYSTEMS FOR ELECTRIC VEHICLES AND SPACECRAFT

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This research highlights the critical role of heat dissipation in specific applications, focusing on photovoltaic systems integrated into electric vehicles and spacecraft. Heat management is of paramount importance in these specialized contexts, where the efficient operation and longevity of solar panels are imperative. Electric vehicles (EVs) with integrated photovoltaic panels require innovative cooling solutions to counteract temperature fluctuations during charging, driving, and parking. For instance, the development of passive and active cooling strategies tailored to the unique challenges of EVs enhances energy capture and contributes to extended battery life. Similarly, spacecraft equipped with solar arrays demand robust thermal control systems to mitigate the extreme temperature variations experienced in outer space. The research investigates the adaptation of advanced cooling technologies, such as phase change materials and deployable radiators, to maintain optimal operating conditions for solar panels in the vacuum of space. By addressing the distinct demands of these specialized applications, this research advances the understanding and development of heat dissipation solutions that not only enhance energy efficiency but also ensure the reliability and mission success of solar-powered electric vehicles and spacecraft.

Keywords: Heat Dissipation; Photovoltaic Systems; Cooling Solutions; Energy Efficiency.

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