

Simulation of Performance and Layout Optimization of Solar Collectors with AVR Microcontroller to Achieve Desired Conditions

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Abstract : This article aims to conserve energy and optimize the performance of solar water heaters using modern modeling systems. In this study, a large-scale solar water heater is modeled using an AVR microcontroller, which is a digital processor from the AVR microcontroller family. This mechatronic system will be used to analyze the performance and design of solar collectors, with the ultimate goal of improving the efficiency of the system being used. The findings of this research provide insights into optimizing the performance of solar water heaters. By manipulating the arrangement of solar panels and controlling the water flow through them using the AVR microcontroller, researchers can identify the optimal configurations and operational protocols to achieve the desired temperature and flow conditions. These findings can contribute to the development of more efficient and sustainable heating and cooling systems. This article investigates the optimization of solar water heater performance. It examines the impact of solar panel layout on system efficiency and explores methods of controlling water flow to achieve the desired temperature and flow conditions. The results of this research contribute to the development of more sustainable heating and cooling systems that rely on renewable energy sources.

Keywords : energy conservation, solar water heaters, solar cooling, simulation, mechatronics

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