

## **ABSTRACT:**

In this work, the photovoltaic panel performance has been investigated theoretically and experimentally were using an array of pin fins as a cooling system. Trying to satisfy the ideal operation conditions of the solar panel, heat sink was fixed on the back of the PV panel to use as a passive technique. An Analytical thermal model based on the steady state and one dimension analysis condition was built to transfer the excess heat from PV panel with the heat sink existing to predict the operation temperature of PV panel. Theoretical results were compared with experimental results of solar panels cooled by heat sink, in order to validate the suggested thermal model. Also, the effect of the solar cells temperature on the panel performance has been studied experimentally. The results display that using pin fins array as a cooling technique led to drop in the average panel's temperature nearly  $4^{\circ}\text{C}$