

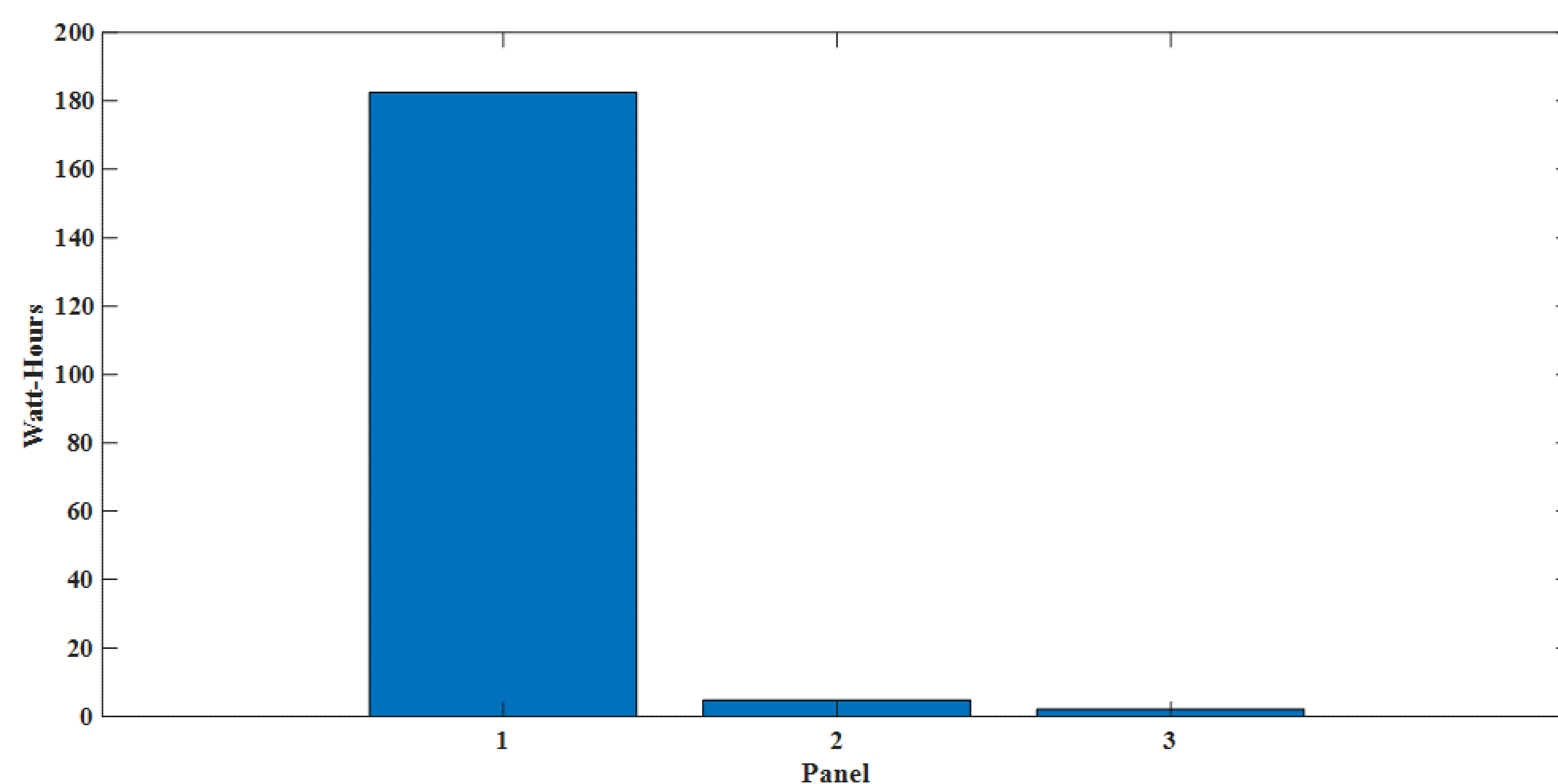
A Study on the Effects of Snow Removal from Solar Arrays on Energy Output

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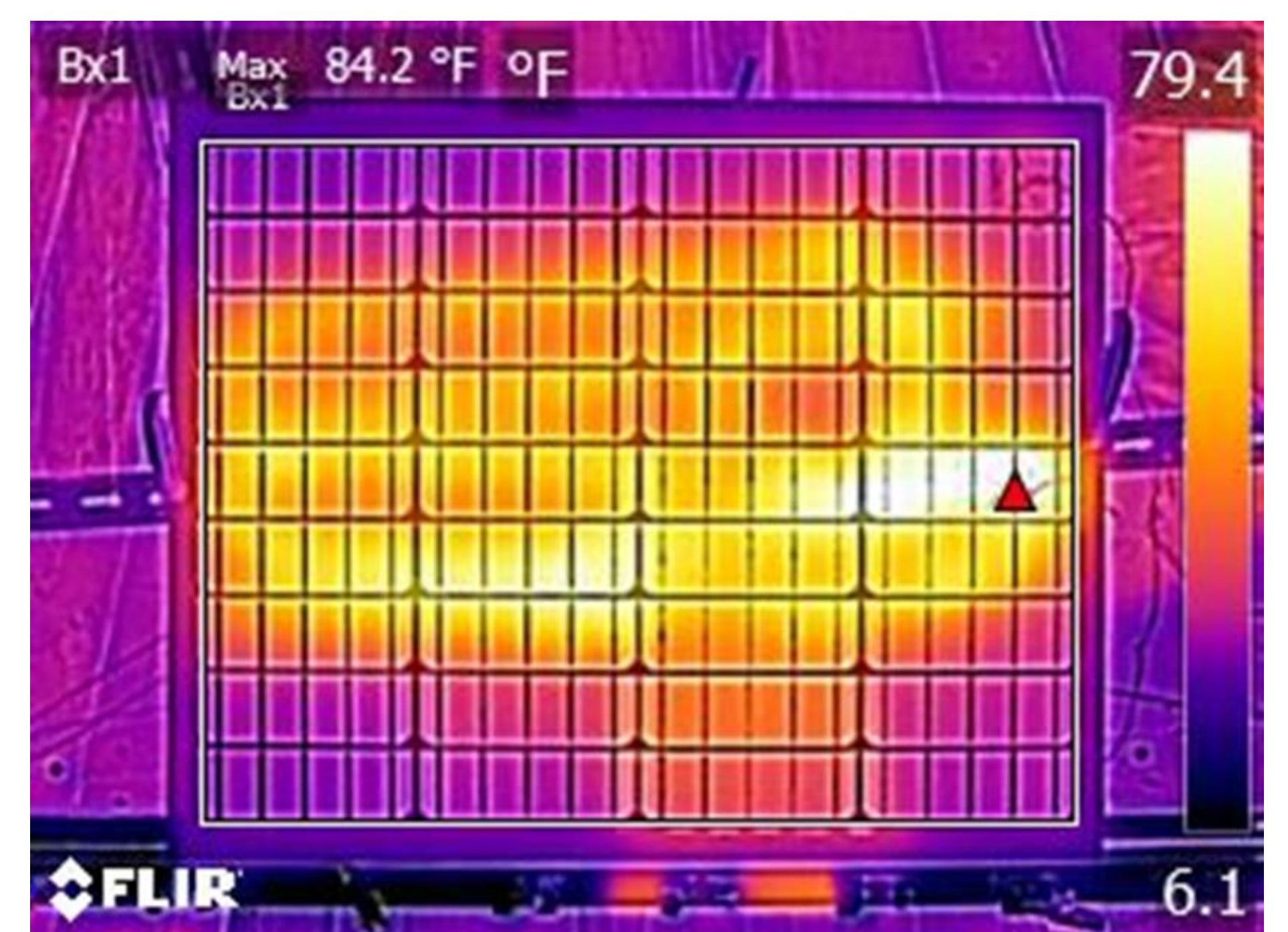
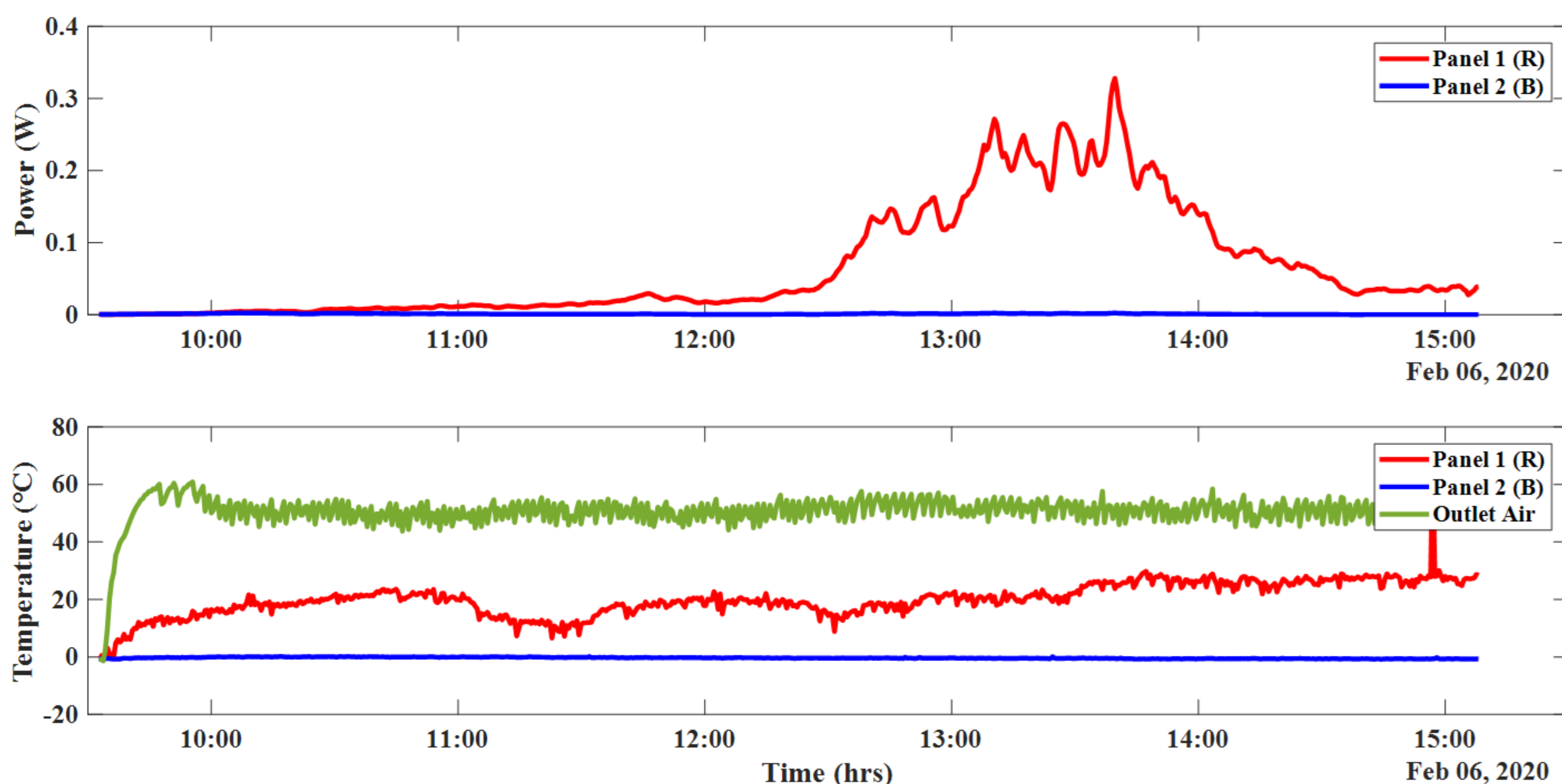
Objective & Methods:

The objective of my project was to study effect of snow on solar panels and to develop thermal methods of removing the snow. The first part of my project focused on quantifying the energy losses following a snowstorm, while the second developed two different thermal methods to remove the snow. The first method of heat the panel was blowing warm air on the back of the panel. This heat could potentially be repurposed building exhaust. The second method was attaching heat tape to the rear of the panel, and warming the array using direct conduction.



Initial Results:

The figure above to the left shows the panels completely covered after a snowstorm on November 19, 2019. The bar chart shows a comparison of power generated after that snowstorm. Immediately following the snowstorm panel 1 was completely cleared manually, panel 2 was partially cleared, and panel 3 was not cleared manually. The amount of energy each panel generated the day following the storm is measured in Watt-hours. It is clear based on this data, a significant amount of energy is lost due to snow covering their surfaces.



Conclusion:

The results from this study indicate that heating solar panels is successful in the removal of snow and that there is an increase in energy output when panels are cleared of snow following a snowstorm. Both of the figures immediately above illustrate the temperatures of the panels and the power that can be generated if they are cleared. There is more work to be done to optimize the heating system and determine where it is geographically feasible, but these initial results show that the removal of snow from panels increases the power output.

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