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Temperature dependence measurements for Cadmium Telluride (CdTe) solar cells FERNANDA DUARTE, WEINING WANG, Department of Physics, Seton Hall University — Traditional silicon (Si)-based solar cells have been studied broadly and have already reached their maximum efficiency. However, their cost is relatively high, preventing them from being widely used. Unlike Si-based solar cells, Cadmium Telluride (CdTe) solar cells are considerably cheap, yet the record efficiency is still lower than that of traditional silicon-based solar cells. More studies are needed to understand and improve the efficiency of CdTe solar cells. In this work, we report our studies of the temperature dependence of CdTe solar cell parameters using the temperature-varying apparatus designed and built by us in-house. This temperature-varying apparatus will be incorporated with a solar cell testing station in order to measure the solar cell parameters while varying the temperature. The solar cell parameters will be measured at different temperatures (with a 100 K temperature range), and the effects of temperature on the open-circuit voltage, short-circuit current and efficiency of the solar cells will be reported. These results allow us to further understand the physics of CdTe solar cells and shine light on how to improve the efficiency of CdTe solar cells.

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