Solar Dish Collector: Case Study in Iraq

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ABSTRACT

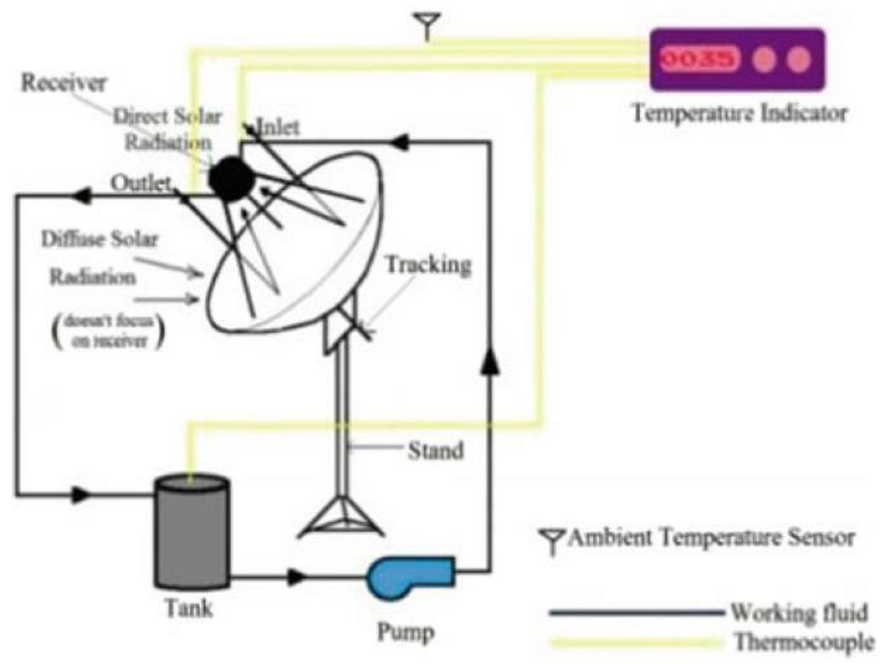
Overview: Nowadays, there is an increasing of the energy demands for the modern societies. With the depletion of the fossil fuel, there should be another sources for energy production. Solar energy is the most renewable energy in a comparison with other types. The present work focuses on utilization of solar dish collector as it a promising techniques in thermal energy transport system. In this way, the present work examines experimentally the utilization of solar dish collector for heating purposes.

Experimental Part: Numerous mirrors had been applied on the dish in order to received the solar irradiance and reflect them into a heat exchanger in which the transport medium is flow and reach into a water tank.

Results: The results showed that the temperature on the heat exchanger was 165 Celsius which leads to make the present work used for other applications such as solar power plants not only the heating purposes.

Experimental Work

The experimental rig consists of solar dish collector, water tank, pipes, heat exchangers, pump, solar tracking systems, thermal camera, thermocouples and temperature data logger. The tank is filled with water and with the help of the water-pump had been forced to flow through the systems and reaches into the heat exchangers in which it receives the solar irradiance from the solar dish collector and back into the water tank. This process is repeated many times from 08:00 AM-04:00 PM in order to find out the temperature within the water tank.



Solar Dish Collector

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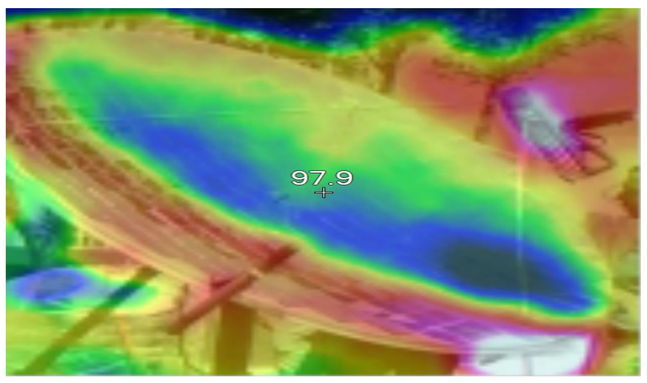
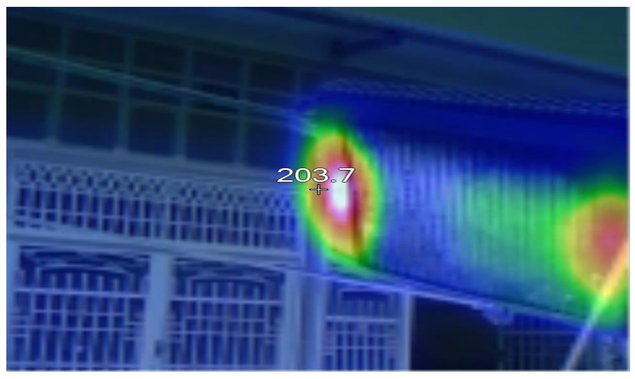
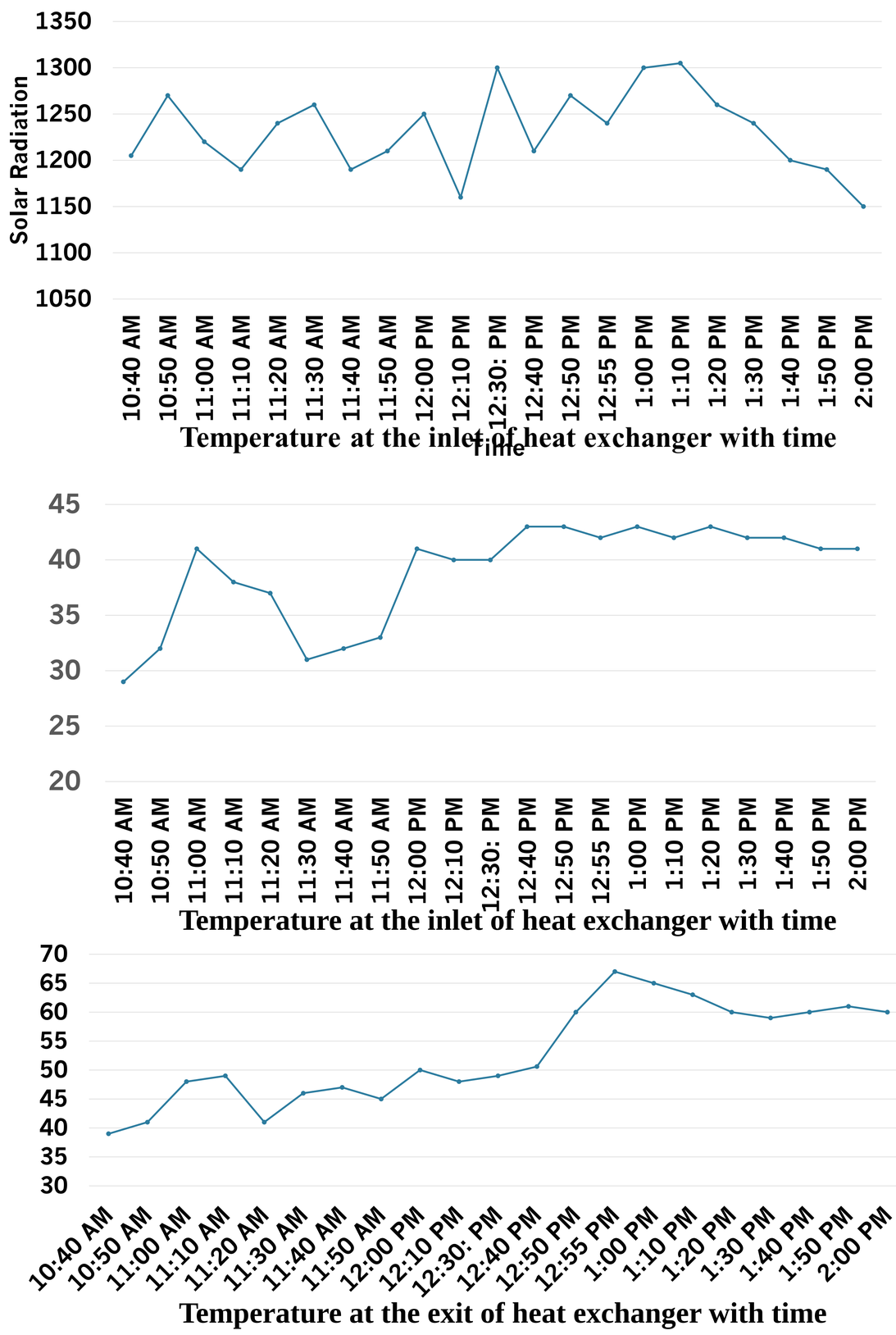
Results







Temperature at the inlet of heat exchanger with time

Temperature at the inlet of heat exchanger with time

Temperature at the exit of heat exchanger with time