

**ECO-FRIENDLY SOLAR REFRIGERATOR: PELTIER
COOLING, REMOTE MONITORING FOR SUSTAINABLE
AND EFFICIENT ENERGY CONSUMPTION**

SKRIPSI



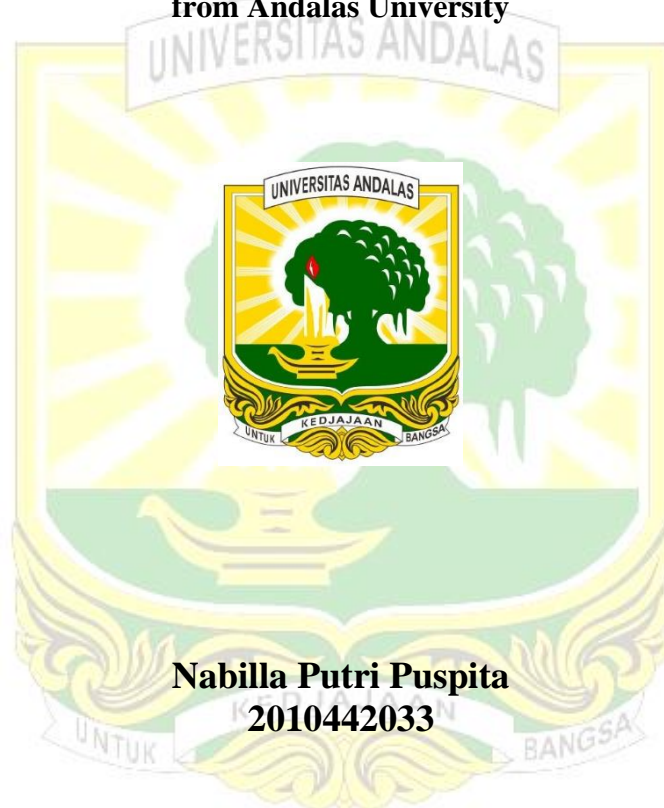
**DEPARTMENT OF PHYSICS
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ANDALAS UNIVERSITY
PADANG**

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**A paper is one of the requirements
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**Nabilla Putri Puspita
2010442033**

**DEPARTMENT OF PHYSICS
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
ANDALAS UNIVERSITY
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ABSTRACT

Cooling technology plays an important role in daily life, such as in refrigerators for storing fruits, vegetables, and beverages. However, the current cooling systems generally use freon that containing chlorofluorocarbons (CFC), which can damage the ozone layer and still rely on conventional as energy sources. This study utilizes the Seebeck Effect on the TEC Peltier 12706 module as an environmentally friendly cooling component and solar panels as the energy sources. To measure the temperature and humidity in this system, a DHT22 sensor is used. The result testing of the DHT22 sensor with AZ HT-02 showed a regression value of $R^2 = 0.9902$ for temperature and the result testing of the DHT22 sensor with FY-11 showed a regression value of $R^2 = 0.9798$ for humidity. A linear regression value close to 1 indicates that the sensor is accurate and functions properly so can be used in this study. The results using 2 TEC 12706 Peltier modules, a 50 Wp solar panel, and a 33 Ah accumulator showed that the lowest temperature achieved was 15°C during data collection from 08:00 AM to 10:00 AM. The largest temperature drop occurred from 12:00 PM to 02:00 PM, amounting to 11.7°C, with an average light intensity of 176,846.1538 Lux. Temperature and humidity in this study were monitored remotely using the Blynk application. The design of an eco-friendly solar refrigeration system featuring Peltier cooling and remote monitoring for sustainable and efficient energy consumption has been successfully created, but it has not achieved the desired temperature.

Keywords: DHT22 Sensor, Refrigerator, Seebeck Effect, Solar Panel, TEC Peltier 12706