# ABSTRAK

# UNJUK KERJA *THERMAL RECEIVER TUBE* PADA *PARABOLIC DISH COLLECTOR* DENGAN *TRACKING SYSTEM*

**OLEH**

**SHIFA QANA LAILA**

Pemanfaatan energi surya melalui *Parabolic Dish Collector* (PDC) menjadi alternatif untuk menghasilkan energi panas bersuhu tinggi. Penelitian ini bertujuan menganalisis karakteristik perpindahan panas dan efisiensi termal receiver tube tembaga berbentuk spiral pada PDC dengan tracking system single axis dan double axis. Pengujian dilakukan secara eksperimental dengan mengukur intensitas radiasi matahari, temperatur fluida masuk dan keluar, temperatur permukaan receiver, serta temperatur lingkungan. Hasil penelitian menunjukkan bahwa penggunaan tracking system double axis mampu meningkatkan temperatur permukaan receiver hingga ±133°C, laju perpindahan panas maksimum sekitar ±670 W, dan efisiensi termal mencapai ±27%. Temuan ini membuktikan bahwa receiver spiral dengan tracking double axis memberikan kinerja termal yang lebih optimal dan berpotensi diterapkan pada sistem pemanas air skala kecil.

**Kata kunci**: *Parabolic Dish Collector*, *receiver spiral*, laju perpindahan panas, efisiensi termal, *tracking system*.

## ABSTRACT

# THERMAL PERFORMANCE OF A RECEIVER TUBE IN A PARABOLIC DISH COLLECTOR WITH A TRACKING SYSTEM

**By**

**SHIFA QANA LAILA**

Utilization of solar energy through Parabolic Dish Collector (PDC) is an alternative to produce high-temperature heat energy. This study aims to analyze the heat transfer characteristics and thermal efficiency of a spiral-shaped copper tube receiver on a PDC with a single-axis and double-axis tracking system. Testing was carried out experimentally by measuring the intensity of solar radiation, inlet and outlet fluid temperatures, receiver surface temperature, and ambient temperature. The results showed that the use of a double-axis tracking system was able to increase the receiver surface temperature by up to ±133°C, the maximum heat transfer rate was around ±670 W, and the thermal efficiency reached ±27%. These findings prove that a spiral receiver with double-axis tracking provides more optimal thermal performance and has the potential to be applied to small-scale water heating systems.



**Keywords**: Parabolic Dish Collector, spiral receiver, heat transfer rate, thermal efficiency, tracking system.