ABSTRACT

Indonesia is a tropical country that receives sunshine throughout the year. Most parts of Indonesia have a long-term average solar intensity that has the potential to generate electricity equivalent to more than 1,600 kWh per square meter. In order to optimize the use of solar energy in Indonesia, a solar tracker system was created to maximize electricity production from solar panels.

In this design, the solar tracker is made using the Linear Quadratic Regulator (LQR) control method to track the angular position required for the solar panel so that it can always follow the direction of the sun's rays, so that it is expected to produce a greater efficiency value of solar panel performance. The test results obtained show that tracking the angular position of the solar tracker with the LQR control method is more stable and can follow the direction of the light with an increased accuracy of 39% when compared to the solar tracker without LQR control.

This dual-axis solar tracker prototype uses an Arduino Pro Mini 5v microcontroller to drive 2 servo motors so that the panels move towards the sun. In addition, 4 LDR sensors are used to receive the intensity of sunlight. From this prototype, direct observations and data collection were carried out which then implemented LQR control to move the servo with input in the form of solar intensity received by the LDR sensor.

Keywords: *Panel surya, Solar Traker, LQR*