CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

S1021

Project Title

Analysis of Energy Efficiency in a Linear Induction Motor

Abstract

Objectives

The goal of this project is to build a linear induction motor using electromagnets and circuits. Then, the power and energy both lost and consumed are calculated and compared with the traditional induction motor (train). The linear induction motor does not interfere with the track or any other object thereby reducing friction of the motor when accelerating. This allows the linear induction motor to travel ina great distance with the same force being applied to the traditional train.

Methods

The linear induction motor is designed by my teacher and I. Magnets are placed on track and electromagnets are attached to the cart. The program used to code the Arduino UNO R3, as a master control of the circuit and the hall effect sensor, is written by myself. My computer science teacher then revised some of the errors in the program.

After completing the design of the linear induction motor, a force applier is used to apply an equal amount of force to the linear induction motor and the traditional train which allows me to calculate the energy lost and used in different conditions.

Results

The project is currently still in progress. Some changes will be made to the linear induction motor. This project didn't function ideally during the LA County Science Fair which required extra time to finalize the motor.

Conclusions

The project is currently still in progress. Some changes will be made to the linear induction motor. This project didn't function ideally during the LA County Science Fair which required extra time to finalize the motor.

Summary Statement

The project includes a self-built electromagnetism linear induction motor which is then compared with the traditional train in terms of energy being wasted and total energy needed to be consumed during acceleration.

Help Received