Abstract Submitted
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Enabling University Satellites to Travel to the Moon and Beyond[1]

GRACE SIY, RICHARD BRANAM, The University of Alabama — Electric propulsion is a method of creating thrust for space exploration that requires less propellant than traditional chemical rockets by producing much higher exhaust velocities, and subsequently costing less. Currently, such forms of propulsion are unable to generate the vast amounts of thrust that traditional thrusters do, thus research is being done in the area. The focus of this project is Hall Effect thrusters, a specific type of ion propulsion. The distinctive feature of these thrusters are magnets which capture the electrons from the cathode. These electrons ionize the propellant gas and then interact with the present electric field to accelerate the resulting ions, generating thrust. The objectives of this project include building two Hall thrusters with different magnet configurations, collecting performance data, and testing with a Faraday probe that directly measures current density. The first magnet configuration will be a conventional Hall Effect thruster arrangement, while the second thruster's magnets are arranged to create a significantly stronger magnetic field. The performance data and Faraday probe results will be used to determine the level of improvement between the thrusters. The goal is to integrate a Hall Effect propulsion system into the university's Cube-Sat program.

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