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FEASIBILITY ANALYSIS FOR ELECTRIC PROPULSION SYSTEMS FOR SHORT TERM  
INTERPLANETARY MISSIONS**Abstract**

Electric propulsion is revolutionizing the world of space travel by reducing the propellant mass penalty drastically while still increasing the power requirement for the same exponentially. Electric propulsion (EP) systems are known to best operate mostly for low thrust trajectories which contributes to longer flight-time in space. This project intends to research on reviewing a hypothetical Mars mission to gather relevant information regarding Entry, Descent, and Landing (EDL) opportunities for astronauts, using existing electric propulsion system designs and then comparing the same with that of the conventional propulsion systems. To make this happen, existing electrostatic and electromagnetic thruster designs are considered for potential flow simulations for computing minimal system requirements to generate significant thrust along with higher specific impulses for small satellite missions. Additionally, this research is going to analyze the trajectories that are most feasible for EP systems for interplanetary transfers and review the mission design parameters through simulations using the Valispace software. With the results obtained from the claimed simulations, it is expected that the project will provide some insight on efficiency of using electric propulsive units for shorter mission lengths and durations. An optimized trajectory and propulsion system analysis is expected as an end result for this project. As part of future work, this study can be extended for developing suitable EP systems for human spaceflights.