Determining the Drag Coefficient of the Falcon 9 Block 5 Rocket

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Rockets have enabled countless technologies that we rely on today, such as GPS, weather satellites, and communications networks. In order to reduce the likelihood of failure during launch, engineers have to pay close attention to the forces rockets are subjected to. In this lab, the drag coefficient, which is used to simulate the drag force a rocket experiences, of a Falcon 9 Block 5 will be calculated. The GPS III SV01 and Iridium NEXT 8 launches were simulated using telemetry data from SpaceX and the net force equation of a rocket F=T-g-D in order to find the drag coefficient. It was found the relationship between drag coefficient and velocity was nonlinear and the average value of the drag coefficient ranges from 0.237 to 0.447. These results are very close to the values for the drag coefficient of the Saturn V rocket at similar speeds.

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