

Abstract Submitted
for the SES19 Meeting of
The American Physical Society

Study on the Forces acting a Rocket to Predict its Trajectories Using Aerodynamics YEJIN CHUNG, Cate School, RICHARD KYUNG, RISE-CRG Research — The trajectories of a rocket result from different forces acting on it. Kinematics and Newton's three laws of motion provide understanding of the rocket's motion upon the launch. The flow of air is critical in the resulting curve; as air moves in one direction, the rocket has to go in the opposite direction. For instance, if the air is slowing down on the right side, a buildup of air creates a higher pressure differential on the right side which pushes the rocket to the left. The forces acting on a rocket in flight are weight, lift, drag and thrust which are the main aerodynamic factors on the rocket. Drag and thrust are two important components of aerodynamic force. In this paper, the magnitude of the forces were studied by changing the factors. The trajectories of a rocket and its motions were studied by changing the values of the factors that affect the forces such as lift, thrust and drag. Also this paper examines the kinematics to decide its motions and also calculation of major forces on the rocket was performed. Accelerations, flight distances, velocities, and other dynamic characteristics were calculated as a function of time.

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Date submitted: 30 Sep 2019

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