

Study of Launch Recovery Control Dynamics of Retro Propulsive Reusable Rockets

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Abstract : The space missions are very costly because the transportation to the space is highly expensive and therefore there is the need to achieve complete re-usability in our launch vehicles to make the missions highly economic by cost cutting of the material recovered. Launcher reusability is the most efficient approach to decreasing admittance to space access economy, however stays an incredible specialized hurdle for the aerospace industry. Major concern of the difficulties lies in guidance and control procedure and calculations, specifically for those of the controlled landing stage, which should empower an exact landing with low fuel edges. Although cutting edge ways for navigation and control are present viz hybrid navigation and robust control. But for powered descent and landing of first stage of launch vehicle the guidance control is need to enable on board optimization. At first the CAD model of the launch vehicle I.e. space x falcon 9 rocket is presented for better understanding of the architecture that needs to be identified for the guidance and control solution for the recovery of the launcher. The focus is on providing the landing phase guidance scheme for recovery and re usability of first stage using retro propulsion. After reviewing various GNC solutions, to achieve accuracy in pre requisite landing online convex and successive optimization are explored as the guidance schemes.

Keywords : guidance, navigation, control, retro propulsion, reusable rockets

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