Nonlinear Dynamics and Systems Theory, **5**(3) (2005) 251–264

Influence of Propellant Burn Pattern on the Attitude Dynamics of a Spinning Rocket

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Received: May 16, 2005; Revised: June 15, 2005

Abstract: This study examines the effect of various propellant burn geometries on the attitude dynamics of a rocket-type variable mass system. The three burn scenarios studied are the end burn, the centripetal burn, and the radial burn. Results of this study indicate that a change in burn scenario changes the predicted attitude motion. The differences are more pronounced for spin motion than for transverse attitude motion. The end burn is recommended whenever it is practically feasible; it is found to be the least disruptive from the point of view of attitude dynamics.

Keywords: *Rockets; variable mass systems; attitude dynamics.*

Mathematics Subject Classification (2000): 70P05, 70M20, 34C60.