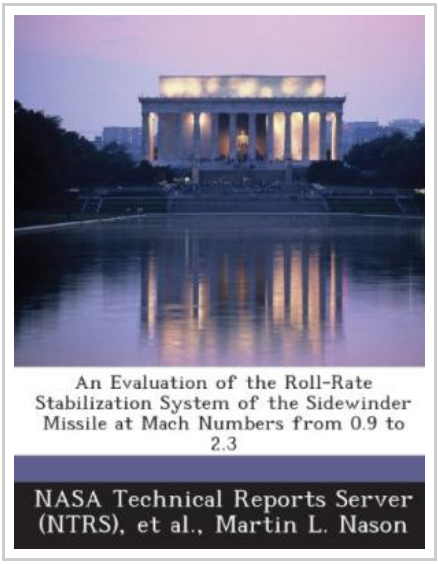

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An Evaluation of the Roll-Rate Stabilization System of the Sidewinder Missile at Mach Numbers from 0.9 to 2.3

By Martin L Nason

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.A linear stability analysis and flight-test investigation has been performed on a rolleron-type roll-rate stabilization system for a canard-type missile configuration through a Mach number range from 0.9 to 2.3. This type damper provides roll damping by the action of gyro-actuated uncoupled wing-tip ailerons. A dynamic roll instability predicted by the analysis was confirmed by flight testing and was subsequently eliminated by the introduction of control-surface damping about the rolleron hinge line. The control-surface damping was provided by an orifice-type damper contained within the control surface. Steady-state rolling velocities were at all times less than 1 radian per second between the Mach numbers of 0.9 to 2.3 on the configurations tested. No adverse longitudinal effects were experienced in flight because of the tendency of the free-floating rollerons to couple into the pitching motion at the low angles of attack and disturbance levels investigated herein after the introduction of control-surface damping.

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