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Analysis of damping derivatives for delta wings in hypersonic flow for curved leading edges with full sine wave
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Abstract
In this study, an attempt is made to evaluate the effect of first arched ends on the damping derived due to the pitch rate aimed at the variable sine wave bounty, flow deflection angle δ, pivot position, and the Mach numbers. Results show that with the escalation in the bounty of the complete sine wave (i.e., positive amplitude) there is an enlightened escalation in the pitch damping derivatives from h = 0, later in the downstream in the route of the sprawling verge it decreases till the location of the center of pressure and vice versa. At the location where the reasonable force acts, when we consider the stability derivatives in damping for the rate of pitch q, there is a rise in the numerical tenets of the spinoffs. This increase is non-linear in nature and not like for position near the leading edges. The level of the stifling derivatives owing to variations in Mach numbers, flow bend approach δ, and generosity of the sine wave remained in the same range. © BEIESP.

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Damping derivative; Delta wing; Hypersonic

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