عنوان مقاله:

Guidelines on Conceptual and Preliminary Design of Hypersonic Waveriders with Different Number of Inlet Ramps

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خلاصه مقاله:

Air-breathing hypersonic flight is presumed by many of the savants in the field of aeronautical engineering as the last boundary of aerial vehicle design to be pushed back. An auspicious design configuration for the prospective hypersonic transport vehicles of the future is a “Waverider,” using the Scramjet engine cycle as its propulsive system. Two-dimensional CFD Analysis and case-to-case study of three pre-defined waverider configurations with ۲-ramp, ۳-ramp, and ۴-ramp inlet geometries are carried out in the hypersonic flight regime of Mach numbers ۵, ۶, and ۷. This is done in an attempt to study the single-oriented and also correlative-oriented impacts of increasing/decreasing the number of inlet ramps and increasing/decreasing the flight Mach number upon the behavior of final aerodynamic coefficients and ratios. The paramount outcome of the present work is the generation of some tables which can be utilized as primary guidelines for aeronautical design engineers who are designing waverider configurations on a preliminary basis.

کلمات کلیدی:

Hypersonics, Waverider Design, Inlet Ramps, aerodynamic coefficients, CFD