

Forward-Facing Step Roughness Effect on the Hypersonic Boundary Layer Flow

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Small forward-facing steps on a flat plate can act as roughness elements to the hypersonic boundary-layer flows. The step height investigated is about 10% of the boundary layer thickness, shocklets are however induced causing a not-insignificant increase in pressure drag. The ratio of step height and local boundary layer thickness is an important parameter which determines shock strength and the amount of drag increase. Since expansion waves exist downstream, shocklets only affect the vicinity of the step. Multiple steps in the present separation distance do not interact with each other.

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