Flow Field Characteristics of Single Expansion Nozzle

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The flow field characteristics through a single expansion nozzle with long flap are studied both experimentally and numerically. This nozzle is designed to deliver Mach number of 1.7. The nozzle pressure ratios of 1.35, 1.45, 1.55, 2, 3, 4 and 5 were chosen for the study. The investigation reveals that single expansion nozzle with long flap is able to deliver Mach number close to design Mach number. The formation of normal shock wave in the single expansion nozzle with long flap induces restricted shock separation on the convergent-divergent portion. The single expansion nozzle with long flap delivers flow characteristics similar that of convergent-divergent nozzle at the nozzle pressure ratios of 4 and 5.

Single expansion nozzle, C-D nozzle, normal shock, Mach number, separation