

## عنوان مقاله:

Experimental Investigations on the Strut Controlled Thrust Vectoring of a Supersonic Nozzle

## محل انتشار:

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## خلاصه مقاله:

The attitude control of a rocket engine using the control surfaces becomes cumbersome particularly in larger rockets with high payload. In such cases, a more effective means of producing forces for controlling the flight is the deflection of exhaust gases, referred to as the gas-dynamic steering or the thrust vector control. In this study, the effect of a strut on the exhaust gas deflection, deployed at the locations;  $0.62 L$ ,  $0.72 L$  and  $0.8 L$  in the divergent-portion of a Mach  $1.84$  nozzle at over-expanded, correctly-expanded and under-expanded states of the jet, has been experimentally investigated. The level of expansion at the nozzle exit is varied by changing the settling chamber pressures from  $4$  bar to  $8$  bar, in steps of  $2$  bar. Further, to study the effect of aspect ratio, the height of strut is varied as  $1.5$  mm,  $2.5$  mm and  $3.5$  mm. The strut of height  $3.5$  mm, deployed at  $x/L = 0.72$ , is found to be the most effective thrust vector control at overexpanded conditions; with a maximum jet deflection of about  $3.60$ , obtained at a settling chamber pressure of  $4$  bar. The Schlieren flow visualization images confirm the findings of wall static pressure data.

## کلمات کلیدی:

Thrust vectoring, Wall static pressure, Schlieren technique, Strut, Mach number

## لینک ثابت مقاله در پایگاه سیویلیکا:

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