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# Passive Control of Elliptic Jet by Using Triangular and Truncated Tabs

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**Abstract :** The mixing promoting efficiency of two identical sharp and truncated vertex triangular tabs offering geometrical blockage of 2.5% each, placed at the exit of a Mach 1.5 elliptic nozzle was studied experimentally. The effectiveness of both the tabs in enhancing the mixing of jets with the ambient air are determined by measuring the Pitot pressure along the jet axis and the jet spread in both the minor and major axes of the elliptic nozzle, covering marginally overexpanded to moderately underexpanded levels at the nozzle exit. The results reveal that both the tabs enhance mixing characteristics of the uncontrolled elliptic jet when placed at minor axis. A core length reduction of 67% is achieved at NPR 3 which is the overexpanded state. Similarly, the core length is reduced by about 67%, 50% and 57% at NPRs of 4, 5 and 6 (underexpanded states) respectively. However, unlike the considerable increment in mixing promoting efficiency by the use of truncated vertex tabs for axisymmetric jets, the effect is not much pronounced for the case of supersonic elliptic jets. The CPD plots for both the cases almost overlap, especially when tabs are placed at minor axis, at all the pressure conditions. While, when the tabs are used at major axis, in the case of overexpanded condition, the sharp vertex triangular tabs act as a better mixing enhancer for the supersonic elliptic jets. For the jet controlled with truncated vertex triangular tabs, the core length reductions are of the same order as those for the sharp vertex triangular tabs. The jet mixing is hardly influenced by the tip effect in case of supersonic elliptic jet.

**Keywords :** elliptic jet, tabs, truncated, triangular
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