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Volume 8, Issue 4, 31 August 2018, Pages 39-44

Passive control of base drag in compressible subsonic flow using multiple cavity (Article)

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Abstract

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Compressible flow in a suddenly expanded square duct was investigated experimentally to assess the effectiveness of the passive control in the form of the cavities. The flow parameters studied were the Mach number, nozzle pressure ratio, L/W ratio, and area ratio. The test were conducted for multiple cavities and without multiple cavities. From experimental results it is seen that the multiple cavity has a very good effect in reduction of base drag by decreasing the base suction and hence increasing the base pressure. From experimental investigation it is found that for all the L/W ratios the effect of multiple cavities are able to control the base pressure, further, it was seen that with the increase in the duct length control is becoming very effective. The wall pressure in the duct indicates that the passive control in the form of cavity do not disturb the flow field in the duct. © TJPRC Pvt. Ltd.

Reaxys Database Information

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Author keywords

[Base flows](#) [Cavity](#) [Mach number](#) [Square duct](#) [Wall pressure](#)

ISSN: 22496890

Source Type: Journal

Original language: English

DOI: 10.24247/ijmperdaug20185

Document Type: Article

Publisher: Transstellar Journal Publications and Research Consultancy Private Limited (TJPRC)

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