

Document details

[< Back to results](#) | 1 of 1[Export](#) [Download](#) [Print](#) [E-mail](#) [Save to PDF](#) [Add to List](#) [More... >](#)[Full Text](#) [View at Publisher](#)International Journal of Mechanical and Production Engineering Research and Development
Volume 8, Issue 3, 30 June 2018, Pages 1001-1008Flow control with aerospike behind bluff body (Article) [\(Open Access\)](#)Khan, S.A.^a, Asadullah, M.^a, Fharukh Ahmed, G.M.^{b,c}, Jalaluddeen, A.^d, Baig, M.A.A.^e^aDepartment of Mechanical Engineering, Faculty of Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia^bDepartment of Mechanical Engineering, Bearys Institute of Technology, Mangalore, Karnataka, India^cDepartment of Mechanical Engineering, Government Engineering College, Karnataka, India[View additional affiliations](#)

Abstract

[View references \(23\)](#)

Flow control in high-speed is challenging due to the high-pressure shock and low-pressure recirculation bubble attached around the vehicle. Wave drag, and Base drag are important accouterments of flow around high-speed objects. This paper deals with base drag, only and presents an experimental study of aerospikes behind the base of bluff bodies to control this drag. A plate of 1 mm thickness with two spikes at 11.5 mm is placed between the nozzle and duct as a passive controller. The Mach numbers deployed for the subsonic regime were 0.6, 0.7 and for transonic regime were 0.8, 0.9 for area ratio 6.25. The L/W ratio taken were 4W, 6W, 8W and 10W. Aerospikes were found to be very effective in controlling base pressure in the transonic regime without influencing the main flow field. © TJPRC Pvt. Ltd.

SciVal Topic Prominence

Topic: [Drag reduction](#) | [Hypersonic flow](#) | [opposing jet](#)

Prominence percentile: 80.561

Author keywords

[Base pressure](#) [Mach number](#) [Wall pressure](#)

ISSN: 22496890

Source Type: Journal

Original language: English

DOI: 10.24247/ijmperdjun2018106

Document Type: Article

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

References (23)

[View in search results format >](#) All [Export](#) [Print](#) [E-mail](#) [Save to PDF](#) [Create bibliography](#)Metrics [View all metrics >](#)

2 Citations in Scopus

2.61 Field-Weighted
Citation Impact

PlumX Metrics

Usage, Captures, Mentions,
Social Media and Citations
beyond Scopus.

Cited by 2 documents

Optimization of area ratio and thrust in suddenly expanded flow at supersonic Mach numbers

Pathan, K.A. , Dabeer, P.S. , Khan, S.A.
(2018) *Case Studies in Thermal Engineering*

Base pressure control by supersonic micro jets in a suddenly expanded nozzle

Khan, S.A. , Chaudhary, Z.I. , Shinde, V.B.
(2018) *International Journal of Mechanical and Mechatronics Engineering*[View all 2 citing documents](#)

Inform me when this document is cited in Scopus:

[Set citation alert >](#)[Set citation feed >](#)

Related documents

Grooved cavity as a passive controller behind backward facing step

Khan, S.A. , Al Robaian, A.A. , Asadullah, M.
(2019) *Journal of Advanced Research in Fluid Mechanics and Thermal Sciences*

- 1 Yunqing, G., Tao, L., Jiegang, M., Zhengzan, S., Peijian, Z.
Analysis of Drag Reduction Methods and Mechanisms of Turbulent (Open Access)

(2017) *Applied Bionics and Biomechanics*, 2017, art. no. 6858720.
<http://www.hindawi.com/journals/abb/contents/>
doi: 10.1155/2017/6858720

[View at Publisher](#)

- 2 Gad-El-Hak, M.
Flow Control: Passive, Active, and Reactive Flow Management. 2000. Cited 581 times.
ed: Cambridge University Press

- 3 Viswanath, P.R.
Flow management techniques for base and afterbody drag reduction

(1996) *Progress in Aerospace Sciences*, 32 (2-3), pp. 79-129. Cited 57 times.
doi: 10.1016/0376-0421(95)00003-8

[View at Publisher](#)

- 4 Tanner, M.
A method for reducing the base drag of wings with blunt trailing edge
(1972) *The Aeronautical Quarterly*, 23, pp. 15-23. Cited 81 times.

- 5 Naughton, J.W.
(2002) *Reduction of Base Drag on Launch Vehicles*. Cited 2 times.

- 6 Pathan, K.A., Khan, S.A., Dabeer, P.S.
CFD analysis of effect of Mach number, area ratio and nozzle pressure ratio on velocity for suddenly expanded flows

(2017) *2017 2nd International Conference for Convergence in Technology, I2CT 2017*, 2017-January, pp. 1104-1110. Cited 10 times.
ISBN: 978-150904307-1
doi: 10.1109/I2CT.2017.8226299

[View at Publisher](#)

- 7 Kangovi, S., Page, R.
The Turbulent flow through a sudden enlargement at subsonic speeds
(1977) *6Th Australasian Hydraulics and Fluid Mechanics Conference. Adelaide*, pp. 213-216. Cited 2 times.

- 8 Eghlima, Z., Mansour, K.
Drag reduction for the combination of spike and counterflow jet on blunt body at high Mach number flow

(2017) *Acta Astronautica*, 133, pp. 103-110. Cited 12 times.
<http://www.journals.elsevier.com/acta-astronautica>
doi: 10.1016/j.actaastro.2017.01.008

[View at Publisher](#)

Counter Clockwise Rotation of
Cylinder with Variable Position to
Control Base Flows

Asadullah, M. , Khan, S.A. , Asrar,
W.

(2018) *IOP Conference Series:
Materials Science and
Engineering*

Low-cost base drag reduction
technique

Asadullah, M. , Khan, S.A. , Asrar,
W.

(2018) *International Journal of
Mechanical Engineering and
Robotics Research*

[View all related documents based
on references](#)

[Find more related documents in
Scopus based on:](#)

[Authors >](#) [Keywords >](#)