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## Position of Static Cylinder Effect on Base Flows (Conference Paper)

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### Abstract

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This paper presents the effect of the cylinder as a passive controller on the recirculation zone behind high-speed objects. The low-pressure recirculation zone was measured for base and wall region with a portable data acquisition system using sixteen solo sensors between reattachment and separation points at angles 0°, 30°, 60°, 90°. Pressure measurements were done by the transducer of National Instruments 9205 Screw Term and Data Acquisition cDAQ-1974. The measurement was done using DAQ connected to 16 solo sensors of 0-150 psi range. In a second it is capable of scanning 250 samples, followed by computing the overall average and store it on the disk. The NI LabVIEW Academic Software using DAQ through pressure sensors acquires data from all the sixteen channels and displays it on the computer screen. The experiments were carried out for overexpanded and perfectly expanded supersonic jets at Mach 2 through the C-D nozzle for area ratio 9. It is found that the control has marginally influenced the base and wall flow field when the control was placed at different positions along the imaginary line from separation to reattachment angled at 30° to the horizontal base and the flow field in the base area along the separation line is mostly independent of its locations except near the exit of the enlarged duct where the flow field is mostly influenced by the back pressure. The control seems to be strongly effective when flow expanded is ideal. © 2020, Springer Nature Singapore Pte Ltd.

### SciVal Topic Prominence

Topic: Circular Cylinders | Vortex Shedding | Bluff Bodies

Prominence percentile: 94.110

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Base drag | Mach number | Nozzle pressure ratio | Passive control | Wall pressure

### Indexed keywords

Engineering controlled terms: Computer programming languages | Cylinders (shapes) | Flow fields | Machine learning | Supersonic aerodynamics | Wall flow

Engineering uncontrolled terms: Computer screens | High-speed objects | National Instruments | Passive controllers | Portable data acquisition systems | Recirculation zones | Separation points | Supersonic jets

Engineering main heading: Data acquisition



### Related documents

Active control of base pressure with counter clockwise rotating cylinder at Mach 2
Asadullah, M. , Khan, S.A. , Asrar, W.
*(2018) 4th IEEE International Conference on Engineering Technologies and Applied Sciences, ICETAS 2017*

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*(2019) 2018 IEEE 5th International Conference on Engineering Technologies and Applied Sciences, ICETAS 2018*

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