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## Impact of expansion level on flowfield with sudden expansion at supersonic regimes

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MATERIALS TODAY-PROCEEDINGS

**Volume:** 46 **Page:** 2775-2782 **Special Issue:** SI **:** **Part:** 7

**DOI:** 10.1016/j.matpr.2021.02.575

**Published:** 2021

**Document Type:** Proceedings Paper

### Conference

**Meeting:** [2nd International Conference on Smart and Sustainable Developments in Materials, Manufacturing and Energy Engineering \(SME\)](#)

**Location:** Nitte, INDIA

**Date:** DEC 22-23, 2020

**Sponsor:** NMAM Inst Technol

### Abstract

This paper aims to assess the control mechanism's efficiency and flow pattern in the pipe. The flow was investigated for Mach numbers  $M = 1.25, 1.3, 1.48, 1.6, 1.8, 2.0, 2.5,$  and  $3.0$  for a step height of  $3\text{ mm}$ . The NPRs of the tests were from  $11$  to  $3$ . The flow revealed the minimum duct requirement for a given Mach number and NPR as  $L = 2D$ . Only some selected cases where control mechanism impacts considerably are presented. In most of the cases, the flow field was the same. There is a reversal in control in the flow field; only such cases are discussed. At low Mach numbers, the flow regulator raises the pressure, and for the rest of the Mach numbers, the control findings are to reduce the pressure except at  $\text{NPR} = 9$  at  $M = 3.0$ ,

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**Author Keywords:** [Sudden Expansion](#); [Jet State](#); [Supersonic Regime](#); [Wall Pressure](#); [Circular Duct](#); [Microjets](#); [Active Control](#)

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### Journal information

MATERIALS TODAY-PROCEEDINGS

**ISSN:** 2214-7853

**Current Publisher:** ELSEVIER, RADARWEG 29, 1043 NX AMSTERDAM, NETHERLANDS

**Research Areas:** Materials Science

**Web of Science Categories:** Materials Science, Multidisciplinary

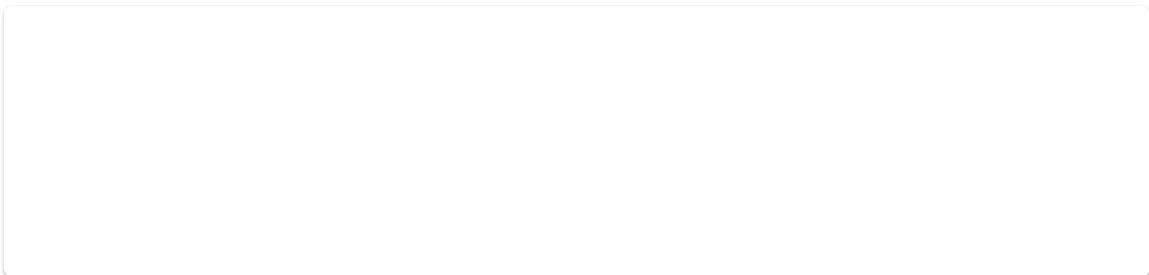
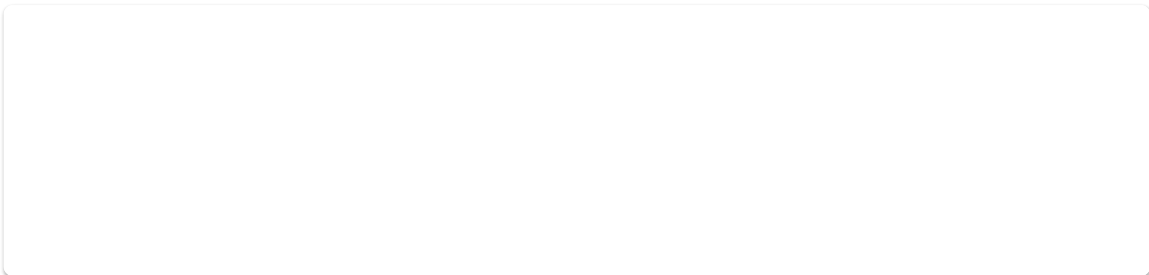
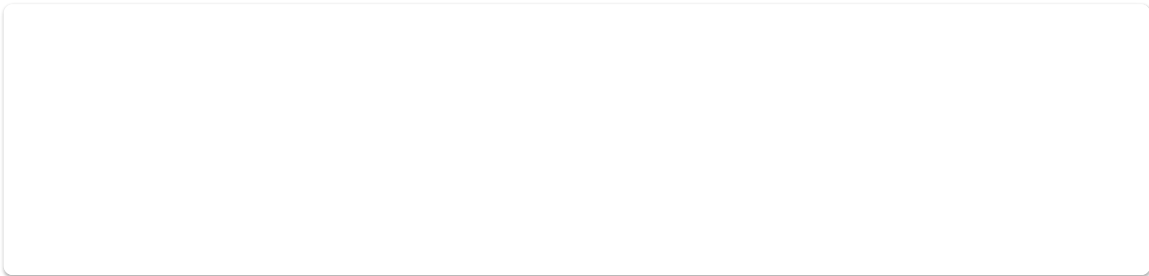
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