



AJMIRA NAGESWARA RAO

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EDUCATION

PhD <i>Aerospace Engineering</i> Indian Institute of Technology Kanpur, India Thesis: Impact of the Nozzle Geometry on Flow Field and Acoustics CPI: 8.0/10	2013 – 2020
M.Tech <i>Aerospace Engineering</i> Indian Institute of Technology Kanpur, India Thesis: Mixing promoting efficiency of three different tab geometries	2008 – 2010
B.Tech <i>Aeronautical Engineering</i> JNTU Hyderabad, India	2004 – 2008

RESEARCH EXPERIENCE

Research Establishment Officer Department of Aerospace Engineering, High Speed Aerodynamics Lab	2022 – 2023 IIT Kanpur, India
Senior Research Fellow Department of Aerospace Engineering, Flow-control and Jet Acoustic Laboratory	2021 – 2022 IIT Kanpur, India
Project Scientist Department of Aerospace Engineering, Flow-control and Jet Acoustic Laboratory	2021 IIT Kanpur, India
Senior Project Associate Department of Aerospace Engineering, Aero Propulsion Laboratory	2012 – 2013 IIT Kanpur, India
Project Associate Department of Aerospace Engineering, National Wind tunnel Facility	2012 IIT Kanpur, India

VOCATIONAL EXPERIENCE

Tutor Course: Thermodynamics (duration: 4 months), IIT Kanpur	2017 U.P, India
Tutor Course: Thermodynamics (duration: 4 months), IIT Kanpur	2016 U.P, India

TEACHING EXPERIENCE

Assistant Professor

Department of Aerospace and Applied Mechanics Engineering

2023 (Sep) - till now
IEST Shibpur, Howrah, India

Senior Lecturer

Department of Aerospace Engineering

2010 - 2012
BBDNITM, Lucknow, India

- Mentored undergraduate students with B.Tech final year project, have been involved with the teaching activities

Courses handling at IEST

Thermodynamics [AE 2204]

Engineering Graphics [AM 1271]

High Speed Aerodynamics Laboratory [AE3271]

Fluid Power Lab

TECHNICAL COMPETENCE

Proficient

CATIA, MATLAB

Intermediate

FLUENT, ICEM, AUTOCAD

Beginner

OPENFOAM

REFERENCES

Dr. Abhijit Kushari

Professor

Department of Aerospace Engineering

IIT Kanpur, India 208016

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Dr. Mohammed Ibrahim Sugarno

Assoc. Professor

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Dr. Alakesh Chandra Mandal

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Dr. Rakesh Mathpal

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Journals

- **A. Nageswara Rao**^a, Talluri Vamsi Krishna, Bhardwaj, Mohammed Ibrahim Sugrno " Nature of unsteadiness in sonic compressible wall jets. (Manuscript Under preparation).
- **A.Nageswara Rao**^a, Vignesh, and Arun K Perumal " Use of Fluidic Injection in Suppressing screech tone" (Manuscript Under preparation).
- **A.Nageswara Rao**, and Abhijit Kushari. "Nature of unsteady and acoustic behavior in an elliptic sonic jet with aft-deck" *Physics of Fluids*, 35, 086104. DOI: 10.1063/5.0159735
- **A.Nageswara Rao**^a, Talluri Vamsi Krishna, and Bhardwaj, Mohammed Ibrahim Sugrno " Effect of Plate Distance on Steady and Unsteady Characteristics of Impinging Rectangular Jet" *Journal of Spacecraft and Rockets*.
- Aqib Khan, **A.Nageswara Rao**^a, Trishank Baghel, Rakesh Kumar, Arun Kumar Perumal. "Parametric study and empirical scaling of a Mach 1.5 jet manipulation by steady fluidic injection." *Physics of Fluids*, 34, 036107 (2022).
- **A.Nageswara Rao**, Abhijit Kushari and A C Mandal. "Screech characteristics of Underexpanded Elliptic jet." *Physics of Fluids*, 32, 2020. DOI: 10.1063/5.00101086
- **A.Nageswara Rao** and Abhijit Kushari. "Underexpanded Supersonic jets from Elliptical Nozzle with Aft Deck." *Journal of Propulsion and Power* 36, no.1 (2019):1-15
- **A.Nageswara Rao**, Abhijit Kushari and Gaurav Kunal Jaiswal. "Effect of Nozzle Geometry on Flow field for High Subsonic Jets." *Journal of Propulsion and Power* 34, no.6(2018): 1596-1608.

Conference Papers

- **A.Nageswara Rao** and Abhijit Kushari. "Screech characteristics using POD and DMD Analysis." The 15th International Conference on Fluid Control, measurements and Visualization, Paper ID: 61, Naples, Italy, 2019.
- **A.Nageswara Rao**, G K Jaiswal and Abhijit Kushari. "Computational Studies of Underexpanded Elliptic Nozzle." 44th National Conference on Fluid Mechanics and Fluid Power, Paper ID: 283, Amrita University, Kerala, 2017.
- **A.Nageswara Rao**, G K Jaiswal and Abhijit Kushari. "Experimental and Computational Investigation of Serpentine nozzle with Elliptic Exit." 1st National Aerospace Propulsion conference "NAPC,IIT Kanpur. Kanpur, 2017.
- **A.Nageswara Rao** and abhijit Kushari. "Characterization of an Underexpanded Jet issuing from a Serpentine Elliptic Nozzle." Asian Congress on Gas Turbines, Paper ID: 97, IIT Bombay, Bombay, 2016.
- **A.Nageswara Rao** and E Rathakrishnan. "Corrugated Cross-wire for Supersonic Jet Control" 10th Asian Symposium on Visualization, Paper ID: 65, SRM University, Chennai, 2010.

Title Impact of the Nozzle Geometry on Flow Field and Acoustics.

Supervisor Prof. Abhijit Kushari and Prof. Alakesh Cahndra Mandal.

Description

The work in my PhD thesis is to study the mixing characteristics of different nozzle geometries. Practical applications include stealth technology such as IR signature, and acoustic radiation are directly related to the jet mixing. Thus, the focus is on designing an efficient nozzle which would have low IR signature level and acoustic intensity with minimal thrust loss. Thus, the Experimental investigation is proposed to understand the flow-field and acoustic signature of the jets from different nozzles at transonic and supersonic conditions.

The Five-hole probe measurements and near-field acoustic measurements are carried out for the transonic jet condition. Pitot static probe and steady schlieren measurements are taken at supersonic condition. Near-field and far-field acoustic measurements are carried out for a range of fully expanded Mach numbers. High-speed schlieren based experimental investigations are also carried out to bring consensus to the underlying mechanism of screech instability. Proper orthogonal decomposition and dynamic mode decomposition's are applied to the schlieren data to make the key characteristics of the screeching jets.