

# AERO ELASTIC ANALYSIS OF AERO SPIKED BODY IN A SUPERSONIC FLOW FIELD USING EXPERIMENT AND SIMULATIONS

Shravya Manda, P. Prasanna  
JNTU College of Engineering  
Kukatpally  
Hyderabad-500 072, India  
Email : [mandashravya@gmail.com](mailto:mandashravya@gmail.com),  
[prajntu@jntuh.ac.in](mailto:prajntu@jntuh.ac.in)

A. Kamalesh  
Scientist  
Research Centre Imarat (RCI)  
Defence Research and Development  
Organisation  
Kanchanbagh Post  
Hyderabad-500 058, India  
Email : [kamalesh@pgad.drdo.in](mailto:kamalesh@pgad.drdo.in)

G. Jagadeesh  
Professor  
Department of Aerospace Engineering  
Indian Institute of Science  
Bangalore-560 012, India  
Email : [jaggie@iisc.ac.in](mailto:jaggie@iisc.ac.in)

P. Theerthamalai  
Outstanding Scientist  
Defence Research and Development  
Laboratory  
DRDO, Kanchanbagh Post  
Hyderabad-500 058, India  
Email : [ptheerthamalai@drdl.drdo.in](mailto:ptheerthamalai@drdl.drdo.in)

## Abstract

The focus of this work is to study the structural response of an aero spiked body in a supersonic flow field of M 2.5 and at zero angle of attack. Fluid-Structure interaction simulations and wind tunnel testing have been carried out on the model for the above condition. 2-way coupled Fluid-Structure Interaction simulations have been carried out to study the aero elastic effect of the aero spike material. The wind tunnel testing for the select condition has been carried out at zero angle of attack for steel spike. The pressure measurement on the flat face cylinder from testing has been compared with that of the simulation data and presented here. Detailed analysis of aero spike deflections, stresses and induced forces due to the shock wave field have been discussed here in detail.

**Keywords:** Unsteady, Shock Wave, Aerospike, FSI, Supersonic, Oscillation