

National Wind Tunnel Facility @ IIT Kanpur

The National Wind Tunnel Facility (NWTF) was established in 1999 at IIT Kanpur, India, to meet the national needs in areas of aeronautical and non-aeronautical R&D activities. The NWTF is a closed-return, continuous, atmospheric wind tunnel equipped with several auxiliary systems for different testing needs. The test section of NWTF is 2.25m high, 3m wide and 8.75m long and is split into two parts; an upstream (5.75m) and a downstream (3m) part. Air speed up-to 80m/s in the test section is produced by a single-stage 12-bladed axial-flow fan powered by a 1000kW variable speed DC motor. Four fine mesh screens placed downstream of the honeycomb and upstream of a 9:1 contraction ensure a flow of exceptionally low turbulence ($u'/U < 0.08\%$).



Areas of Research

- Decelerator Aerodynamics
- Development of High Lift Devices
- Unsteady and High Angle of Attack Aerodynamics
- Transport Aircraft Studies Including Development of Airfoils
- Missile Aerodynamics
- Helicopter Aerodynamics
- Aerodynamics of Road Vehicle
- Wind Effect on Structures
- Aerodynamics of Wind Power Devices
- Bridge Aerodynamics

Important features of NWTF

- Sting Type model support system with five independent motions
- Turntable systems for aerospace and non aerospace applications
- Laser light sheet generation system for flow visualization
- 3D Stereoscopic PIV system
- Hot wire anemometry

Special Capabilities of NWTF

- Full model testing with sting support system
- Half model testing with external balance
- Two-dimensional model testing using turntables
- Gust and cross wind simulation
- Aero-acoustic testing
- Engine intake studies using suction mass flow system
- Can be configured as open jet facility



Missile
Aerodynamics



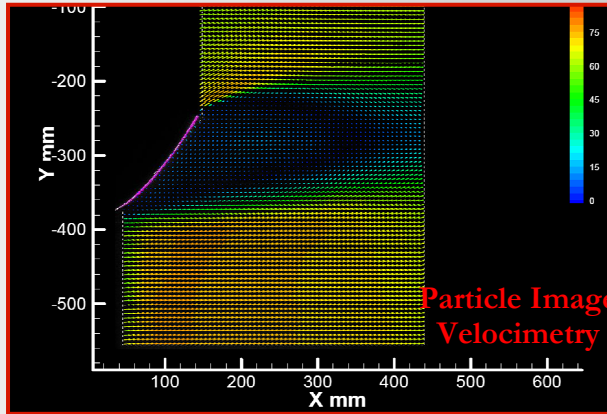
High Lift
Aerodynamics



Vehicle
Aerodynamics



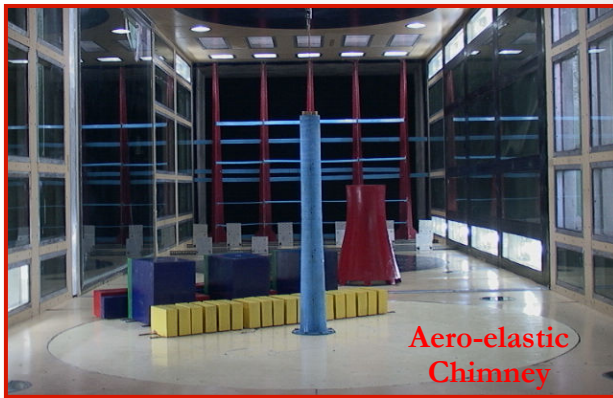
Regional
Transport Aircraft



Particle Image
Velocimetry



Wind
Engineering



Aero-elastic
Chimney



Decelerator
Aerodynamics

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