

PROJECT INTRODUCTION

Objectives

To develop a better understanding of the turbulent structures existing in a compressible jet.

Project Investigator / Manager

Dr. Tsai Her Mann
Temasek Laboratories
tslthm@nus.edu.sg

Website

www.temasek-lab.nus.edu.sg

Abstract

Uses the Direct Numerical Simulation (DNS) and Large Eddy Simulation (LES) to study the jet flows for better understanding the phenomena involved.

PROJECT DETAILS

Description

The simulation of compressible jets ejected out of a supersonic nozzle into a larger space is important for several engineering applications including mixing propulsion and aeroacoustics. Turbulent jets have large-scale coherent structures. The understanding of these structures is essential for the refinement of existing theory and models, improvement of engineering systems that use jet concepts, and the development of new methods for controlling turbulence.

There have been a few numerical studies of compressible jet flow. In the present project, DNS, which aims to resolve all the relevant scales occurring within the flow, and LES will be used. As a first step, the project will focus on the study of the subsonic and supersonic flow in a channel to verify the numerical algorithms developed in the code. The final objective of the ongoing research is the application of LES and DNS to the jet flows for better understanding the phenomena involved.