

초음속 Cavity 유동에서 발생하는 압력변동 제어에 관한 연구

정성재[†](안동대 원) · 이영기^{*}(안동대) · T. Aoki(큐슈대), 김희동^{**}(안동대)

A Study on the Control of Pressure Oscillations in a Supersonic Cavity Flow

Sung-Jae Jung, Young-ki Lee, Toshiyuki Aoki and Heuy-Dong Kim

Key Words: Compressible Flow(압축성 유동), Flow Control(유동제어), Shock Wave(충격파),
Supersonic Cavity Flow(초음속 공동 유동), Pressure Oscillation(압력진동)

Abstract : The supersonic flow over a cavity has many practical applications in a variety of aerospace and industrial fields. It has been well known that significantly complicated three-dimensional flow phenomena are generated inside the cavity, almost always leading to strong pressure oscillations. In the present study, a computational analysis has been conducted to suppress pressure oscillations in a supersonic flow passing over a rectangular cavity using passive control with triangular bump located before the cavity. The three-dimensional, compressible Navier-stokes equations are numerically solved based on a fully implicit finite volume scheme and large eddy simulation. The results will show how effective the present control method is, compared with active pressure oscillation control suggested previously.

삼중 제트의 유동 특성에 관한 연구

이명재[†](부산대 원) · 김동건^{*}(부산대)
· 김문경^{**}(창원전문대) · 윤순현^{**}(부산대)

A Study on the Flow Characteristics of the Triple Jets

Lee Myung Jae, Kim Dong Keon, Kim Moon Kyung and Yoon Soon Hyun

Key Words: Triple Turbulent Impinging Jets(삼중 난류 충돌제트), Particle Image Velocimetry(입자영상유속계), Turbulent Intensity(난류강도), Interaction of jets(제트의 간섭)

Abstract : Experiments were conducted to show the characteristics of the flow on triple parallel plane impinging jets. Measurements of mean velocity components and turbulent intensities were carried out with a particle image velocimetry(PIV) to investigate the flow field generated by the air issued from three identical plane parallel nozzles and mixed with the ambient air. The measurements range of these experiments were Reynolds number of 5000 based on the nozzle width and the case of nozzle-to-plate distances were two times, six times and ten times the width of the nozzle. Results show that potential core length of triple jets is shorter than that of single jet because of jet interaction. In case of the spanwise turbulent intensity for the wall jet, triple jets are the higher three times than single jet.