

## 저마하수 난류 끝단 소음 예측

장강욱<sup>†</sup> · 서정희\*(고려대 원) · 문영준\*\*(고려대)**Turbulence Trailing-Edge Noise Prediction at Low Mach Numbers**

K. W. Chang, J. H. Seo and Young J. Moon

**Key Words:** Turbulence Trailing-Edge Noise(난류끝단소음), Low Mach Number Aeroacoustics(저마하수 공력소음), Hydrodynamic/Acoustic Splitting Method(유동/소음 분리기법)

**Abstract :** Turbulence noise generated by the trailing-edge of a flat plate at Reynolds number based on the thickness of a flat plate  $Re_h = 4.0 \times 10^3$  and the freestream Mach number  $M_o=0.06$  is computationally predicted by a hydrodynamic/acoustic splitting method. The turbulent flow field is simulated by the incompressible large eddy simulation(iLES) and the acoustic field is efficiently predicted by the linearized perturbed compressible equations(LPCE). The statistical properties of the turbulence trailing-edge noise are investigated via spectral analysis, in order to identify the trailing-edge noise sources. The computational predictions are compared with the experimental data of Roger and Moreau.

## 랩온어칩 내부 미세유동제어를 위한 압력제어장치 개발

한수동<sup>†</sup> · 김국배\*(포항공대 원) · 이상준\*\*(포항공대)**Development of Flow Control Technique for Handling Infinitesimal Flows inside a Lab-On-a-Chip**

Su Dong Han, Guk Bae Kim and Sang Joon Lee

**Key Words:** Lab-On-a-Chip(LOC, 랩온어칩), Pressure Regulator(압력 레귤레이터), Pressure Chamber(압력 챔버), Solenoid Valve(솔레노이드 밸브), Capillary Tube(모세관)

**Abstract :** A syringe pump or a device using a high electric voltage has been used for controlling flows inside a LOC (lab-on-a-chip). Compared to LOC, however, these devices are so large and heavy that they are burdensome in the development of a portable  $\mu$ -TAS (micro total analysis system). In this study, a new flow control technique employing pressure regulators and pressure chambers was developed. In addition, the performance of this flow control system was compared with that of a conventional syringe pump. The developed flow control system was found to have superior performance compared to the syringe pump. It maintains automatically the air pressure inside a pressure chamber whether the flow inside a capillary tube is on or off.