

## 층상화된 Taylor-Couette 유동에 대한 전산 해석적 연구

김동우<sup>†</sup>(인하대 원) · 황종연\* · 양경수\*\* (인하대)

## Numerical Simulation of Stratified Taylor-Couette Flow

Dong-Woo Kim, Jong-Yeon Hwang and Kyung-Soo Yang

**Key Words :** Stratified flow (층상유동), Taylor vortex (테일러 와류)

**Abstract :** The flow regimes observed for a Taylor-Couette flow with a stable, axial stratification in density are investigated using numerical simulation. The flow configuration identical to that in the experiment of Boubnov, et al. (1995) is considered in the present research. The main objectives of this investigation are to verify the experimental and numerical results carried out by Boubnov, et al. and Hua et al. (1997) and to further study the detailed flow fields and flow bifurcation. With increasing buoyancy frequency of the fluid ( $N$ ), the stratification-dominated flow regime, called the S-regime, is observed. It is also confirmed that the important effect of an axial density stratification is to stabilize the flow field, depending on  $N$ . The present numerical results are in good agreement with Boubnov, et al. and Hua et al.'s observations.

## 환형고체의 열변형에 대한 차열관 효과 해석

김종현<sup>†</sup> · 김영남\* · 이진욱\*(ATES) · 강국정\*\* · 한태호\*\* · 안상태\*\*(ADD)

## The Analysis of the Thermal Shroud Effects about Thermal Deformation of the Gun Barrel by Solar Heating

J. H. Kim, Y. N. Kim, J. W. Lee, K. J. Kang, T. H. Han, S. T. Ahn

**Key Words:** Thermal Shroud(차열관), Thermal Deformation(열변형)

**Abstract :** The firing of tank cannon must be done outdoors, where environmental factors such as sunlight, precipitation and wind. Usually drift in gun muzzle orientation by solar heating are generally attributed to thermal stresses generated by temperature differences on gun barrel. So there are needed some tank cannon components, such as thermal shrouds which are used to reduce the amplitude of such drifts. One purpose of this study by numerical analysis is to clarify the thermal shroud effects about thermal deformation of the gun barrel by solar heating and wind, and the other purpose of this study is to set up the process of the coupled analysis of fluid dynamics with thermal stresses.