

## 이륜자동차의 촉매 변환기 내부 유동 균일도에 관한 수치해석

이중섭<sup>†</sup>(경상대 원) · 서정세\* · 정한식\* · 정효민\* (경상대) ·  
 배태열\*\* (창원전문대) · 배재영\*\*\* (대림자동차)

### Numerical Analysis on the Flow Uniformity in Catalytic Converter of Motor Cycle.

Chungseub Yi<sup>†</sup>, Jeongse Suh\*, Hanshik Chung\*  
 Hyomin Jeong\*, Taeyoul Bae\*\*, Jaeyoung Bae\*\*\*

**Key Words:** Catalytic converter(촉매장치), Flow uniformity(유동균일도), Monolith(담체)

**Abstract :** This study represents about the flow uniformity and pressure drip in catalytic converter. Present research model type is monolithic catalytic converter and this type have been widely used for satisfy and the regulations of pollutant emissions in automobiles. The flow characteristics in a single monolith automotive catalytic converter were investigated by using a computational simulation method. The numerical model with a general cartesian coordinates system is assumed as the steady state, compressible flow and RNG/k- $\epsilon$ turbulence model. The inlet flow of catalytic converter is assumed as a uniform distributed flow and it was varied from 2m/s to 20m/s. Flow uniformity can be improved by inlet velocity increasing. As a numerical simulations, the efficiency of model-3 is increased by inserting a inner guide.

## 원통좌표계에서의 특이성 해소를 위한 조화함수의 적용

서 용 권<sup>†</sup>(동아대)

### Application of Harmonic Functions to Avoid the Singularity Problem in the Cylindrical Coordinates

Yong Kweon Suh

**Key Words:** Cylindrical Coordinates(원통좌표), Harmonic Function(조화함수), Singularity(특이성)  
 Lamb-Dipole Flow(Lamb의 쌍극 유동)

**Abstract :** Fluid flows within a circular boundary are susceptible to a singularity problem when the cylindrical coordinates are employed. To remove this singularity a method has been developed in this study which uses the harmonic functions in discretization of derivatives as well as interpolation. This paper describes the basic reason for introducing the harmonic functions and the overall numerical methods. The numerical methods are evaluated in terms of the accuracy and the stability. The Lamb-dipole flow is selected as a test flow. We will see that the harmonic-function method indeed gives more accurate solutions than the conventional methods in which the polynomial functions are utilized.