

## 난류유동에서 이차 라그랑지안 스토캐스틱 모델에 의한 확산 연구

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### On the dispersion of the second-order Lagrangian stochastic model in turbulent flows

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**Key Words:** Lagrangian stochastic model(라그랑지안 스토캐스틱 모델) Reynolds number(레이놀즈 수) Spin(스핀)

**Abstract :** Performance of the second-order Lagrangian stochastic model of Reynolds et al.(2004) for particle dispersion in turbulent flows is assessed. We correct original Reynolds model to novel second-order Lagrangian stochastic model by modifying diffusion terms. new model give a good agreement with fundamental statistics of turbulent channel flows such as Reynolds stress Also, the statistics of spin such as the mean rotation is compared. modified model observe better prediction than Reynolds model. but high-order statistics of spin and more accurate model for predicting spin is needed

## 버블 잉크젯에 관한 수치적 연구

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### Numerical Study on a Bubble Inkjet Process

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**Key Words:** Bubble Growth(기포성장), Bubble Inkjet(버블 잉크젯), Droplet Ejection(액적 분사), Level Set Method(Level Set 방법)

**Abstract :** A bubble inkjet process including bubble growth and collapse as well as droplet ejection is investigated by numerically solving the conservation equations for mass, momentum and energy. The phase interfaces are tracked by a level set method which is modified to include the effects of phase change at the interface and extended for multiphase flows with irregular solid boundaries. The compressibility effect of a bubble is also included in the analysis to appropriately describe the bubble expansion behaviour associated with the high pressure caused by bubble nucleation. The present computation describes not only droplet formation behavior but also jet breaking and satellite droplet formation. Various heating conditions are tested to investigate their effect on bubble growth and droplet ejection.