

Advances in Engineering Mechanics and Materials

- **Proceedings of the 2014 International Conference on
Civil Engineering (CIVILENG 2014)**
- **Proceedings of the 2014 International Conference on
Industrial Engineering (INDE 2014)**
- **Proceedings of the 2014 International Conference on
Continuum Mechanics (COME 2014)**
- **Proceedings of the 2014 International Conference on
Materials (MATERIALS 2014)**

Santorini Island, Greece, July 17-21, 2014

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Plenary Lecture 1

Investigate of Air Core Phenomenon in Cylindrical Tank during Draining



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Abstract: An air core phenomenon observed from lavatory bowl draining in our daily lives has a very important scientific meaning because it is also observed from many industrial applications and related with a natural phenomenon such as tornado. Moreover since the air core affects the drain flow rate, it is deeply connected with a disaster such as flood from local heavy rain. In order to prevent air core generation, various ideas have been suggested and demonstrated experimentally: for example, inclining the tank's bottom wall, positioning the drain port eccentrically, and other types of vortex suppressing device. Very recently, we found that the generation of air core highly depends on the temperature of water. To investigate the mechanism of air core suppressing while draining, the numerical simulation on air core phenomenon is introduced and a lot of simulating results will be presented. In addition, 3-D flow structures such as toroidal Taylor vortex rings and spiral waves on free surface which could not be obtained in axisymmetric simulations will also be demonstrated.

Brief Biography of the Speaker:

Professional Experience and Honours:

1991 to 1994 : ADD Team Manager of Small Jet Engine development

1994 to 1996 : Assistant Professor, Kyungpook National University

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b) PIV Measurement for Thermal-Fluid Flow Phenomena

c) Flow Induced Vibration

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