Computational multiphase flow applied to industrial processes

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ABSTRACT

Industrial processes involve dynamics of several types of fluids. Moreover, these fluids are in general multiphase. Combustion chambers in motors, nuclear power plants, metal and glass processing, alloy quenching and casting catalytic fuel cracking, CO_2 separation, water waste treatment are examples among others in which multiphase flows occur [1]. Understanding the multiphase flow dynamics is critical for engineers and scientists to optimize or create innovative processes or optimization.

Computational modelling of industrial-size multiphase flow systems must be grounded on reliable models and on robust and efficient numerical methods. With the increase of computational power and numerical techniques, the possibility of description of computational multiphase flows is more widespread. The purpose of this mini symposium is to draw an overview on modelling and numerical techniques. All dispersed flows, two-fluid models [2] will be reviewed. The method of population balance equations will be also considered [3]. Interface transport using the volume-of-fluid, level-set or phase field methods will be also reviewed. The specific modelling of reactive and turbulent flows will be addressed.

The mini symposium will be scheduled with plenary talks on specific topics. The other talks will be open to communication.

REFERENCES

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[3] D. L. Marchisio and R. O. Fox, *Computational models for polydisperse particulate and multiphase systems*, Cambridge University Press, 2013.