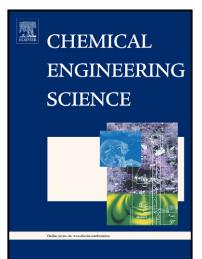
Author's Accepted Manuscript

TRANSIENT ANALYSIS OF A SINGLE RISING BUBBLE USED FOR NUMERICAL VALIDATION FOR MULTIPHASE FLOW

Gholamreza Keshavarzi, Ryan S. Pawell, Tracie J. Barber, Guan H. Yeoh



www.elsevier.com/locate/ces

PII:S0009-2509(14)00091-8DOI:http://dx.doi.org/10.1016/j.ces.2014.02.027Reference:CES11540

To appear in: Chemical Engineering Science

Received date: 30 September 2013 Revised date: 28 January 2014 Accepted date: 21 February 2014

Cite this article as: Gholamreza Keshavarzi, Ryan S. Pawell, Tracie J. Barber, Guan H. Yeoh, TRANSIENT ANALYSIS OF A SINGLE RISING BUBBLE USED FOR NUMERICAL VALIDATION FOR MULTIPHASE FLOW, *Chemical Engineering Science*, http://dx.doi.org/10.1016/j.ces.2014.02.027

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

1 TRANSIENT ANALYSIS OF A SINGLE RISING BUBBLE USED FOR

2

NUMERICAL VALIDATION FOR MULTIPHASE FLOW

 Gholamreza Keshavarzi¹, Ryan S. Pawell¹, Tracie J. Barber¹, Guan H. Yeoh¹
¹School of Mechanical and Manufacturing Engineering, University of New South Wales, Sydney, Australia

7 ABSTRACT

Accurate tracking of multiphase interfaces (such as an air bubble in a fluid) is difficult yet 8 significant to many engineering processes. Computationally, various tracking methods have 9 been developed, including the volume of fluid (VOF), and coupled level set and volume of 10 fluid (CLSVOF) methods. In order to accurately assess the small-scale differences between 11 different interface capturing methods, a comprehensive experimental dataset is required for 12 validation, including detailed information describing the interface deformation, and transient 13 development of the stage by stage shape data. These interfacial details are better investigated 14 from a two-dimensional (2D) rather than three-dimensional (3D) comparison, because the 15 computational resources for determining an accurate shape can be maximized, and the 16 17 interfacial complex deformation is difficult to analyse in 3D. In this paper, the fully 18 developed shape and subsequent deformation of 2D rising bubbles have been captured 19 experimentally and analysed in detail using image processing. These results are then 20 compared with the corresponding VOF and CLSVOF results, demonstrating the usefulness of 21 the experimental dataset as a validation tool.

22

23 NOMENCLATURE

2D	Two-dimensional
3D	Three-dimensional
A	Area

Download English Version:

https://daneshyari.com/en/article/6591301

Download Persian Version:

https://daneshyari.com/article/6591301

Daneshyari.com