

Accepted Manuscript

Experimental Investigation of the Kelvin-Helmholtz Instabilities of Cylindrical Gas Columns in Viscous Fluids

Huayong Zhao , Benjamin Bhabra

PII: S0301-9322(17)30806-6
DOI: [10.1016/j.ijmultiphaseflow.2018.03.017](https://doi.org/10.1016/j.ijmultiphaseflow.2018.03.017)
Reference: IJMF 2772



To appear in: *International Journal of Multiphase Flow*

Received date: 19 October 2017
Revised date: 18 March 2018
Accepted date: 22 March 2018

Please cite this article as: Huayong Zhao , Benjamin Bhabra , Experimental Investigation of the Kelvin-Helmholtz Instabilities of Cylindrical Gas Columns in Viscous Fluids, *International Journal of Multiphase Flow* (2018), doi: [10.1016/j.ijmultiphaseflow.2018.03.017](https://doi.org/10.1016/j.ijmultiphaseflow.2018.03.017)

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 proof before it is published in its final 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.

Highlights

- The analytical solutions of the critical and most unstable Kelvin-Helmholtz instability conditions for a cylindrical interface between two viscous immiscible fluids with finite depths have been presented.
- The most unstable conditions predicted by the Viscous Corrections of the Viscous Potential Flow (VCVPF) KH model match well with the measured air column breakup conditions when the interface is not exposed to highly turbulent flows.
- The cylindrical interface size has noticeable effect on the critical conditions but have negligible effects on the most unstable conditions for interfaces have radius bigger than 1.2 mm
- The critical instability condition can be sensitive the interface size, the chamber size and the perturbation symmetry, the most unstable conditions are insensitive to all these parameters.

ACCEPTED MANUSCRIPT

Download English Version:

<https://daneshyari.com/en/article/7060070>

Download Persian Version:

<https://daneshyari.com/article/7060070>

[Daneshyari.com](https://daneshyari.com)