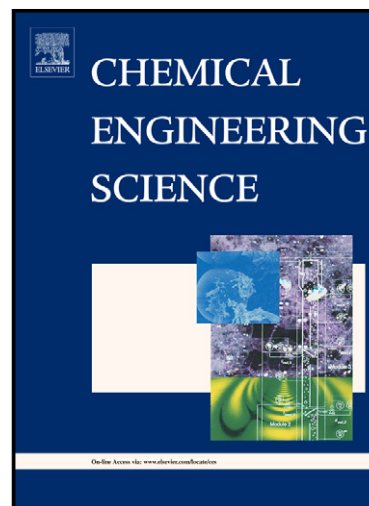


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Atsuhide Kitagawa, Yuichi Murai



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## Pulsatory rise of microbubble swarm along a vertical wall

Atsuhide Kitagawa <sup>a,\*</sup>, Yuichi Murai <sup>b</sup>

<sup>a</sup> Department of Mechanical and System Engineering, Kyoto Institute of Technology,

Goshokaido-cho, Matsugasaki, Sakyo-ku, Kyoto 606-8585 Japan

<sup>b</sup> Division of Energy and Environmental System, Faculty of Engineering, Hokkaido University,

Kita-13, Nishi-8, Kita-ku, Sapporo 060-8628 Japan

\* Corresponding author. Tel: +81 75 724 7327; Fax: +81 75 724 7300;

E-mail: kitagawa@kit.ac.jp (A. Kitagawa).

### ABSTRACT

Based on the experimental finding that microbubble swarms dramatically promote heat transfer from a vertical heated wall, despite their potentially adiabatic nature, tests of microbubble fluid mechanics in the isothermal state are performed to clarify the unique motion characteristics of microbubble swarms. At constant bubble flow rate, the microbubble swarm shows a significant pulsatory rise along a vertical flat wall, particularly for small bubbles. Particle tracking velocimetry applied to the microbubbles shows that a two-way interaction between the microbubbles and the liquid flow self-excites the pulsation during their

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