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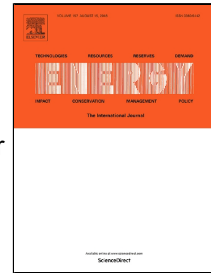
Enhancement of momentum transfer of bubble swarms using an ejector with water injection

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1 **Enhancement of momentum transfer of bubble swarms using**
2 **an ejector with water injection**

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9 **Highlights**

- 10 1. Bubble swarms characteristics generated from ejectors are experimentally investigated
11 2. Digital image processing is carried out to obtain statistical data of bubble swarm
12 3. Momentum transfer is demonstrated by a buoyancy experiment with a spherical model
13 4. Uniform bubble swarm is realized by the proposed ejector with water injection

14
15 **Abstract**

16 This paper presents the application and a comparative study of two ejector configurations to enhance the
17 momentum transfer of submerged bubble swarms generated in a water tank. High-speed photography was used to
18 measure the bubble rise velocity profiles and bubble size distribution from captured images. The volumetric
19 flowrate of air was varied from 2 to 15 L/min, and water was supplied at 70 L/min for the case with water injection.
20 Three different cases were selected to conduct bubble swarm visualization: one with a plain nozzle, one with an
21 air-driven ejector, and one with a water-driven ejector. Buoyancy experiments were also carried out to characterize
22 momentum transfer capability. The plain nozzle and air-driven ejector cases make ergodically large bubbles.
23 However, in the case with water injection, small bubbles were generated through the suction and mixing chamber
24 inside the ejector, and evenly sized broken-up bubbles came out. Due to the differences in bubble generating

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