

# Effect of bubble size on bubble rising velocity and stagnation in a granular bed

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## Abstract

The hydrodynamics of gas and liquid flow through a granular bed were proposed in this work. A high-speed camera was used to capture bubbles at different heights in a granular bed. The effect of bubble size on the rising velocity and stagnation of single bubble and multiple bubbles was investigated. The results showed that a single bubble rose along a non-uniform trajectory. The average rising velocity increased nonlinearly with the increase of the initial bubble diameter. This work also provides a visual verification that multiple bubbles stagnation occurs. The results show that the rising velocity and bubble size were the two key factors, which dominate the stagnation probability. The rising velocity of multiple bubbles is expressed by the overall velocity, and the bubble size is expressed by the projected area, which is found the bubble projection area and the overall velocity of the bubbles were negatively correlated with the stagnation.

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