

Thesis Title Aerodynamic Interaction Forces between Two Tandem Spheres

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ABSTRACT

The objective of this study is to determine aerodynamic interaction forces between two tandem spheres. The study is divided into three parts. Using potential flow analysis, numerical method to simulate the flow on the sphere by using commercial software and the experiment. The mathematical model was formulated under the assumption of potential flow with no-slip conditions at the sphere surfaces and spheres were not rotated. It was found that the aerodynamic forces depend on the position between two spheres. The aerodynamic forces decreases when the distance between two spheres increases. The numerical analysis and the experiment show that the value of the aerodynamic forces of the upstream sphere are much more than the downstream sphere if the horizontal distance between two spheres is under 4 times of sphere's diameter and the vertical distance between two spheres is under 2 times of sphere's diameter. But they are no influence if the distances between two spheres are further than that. As a result, this study should be beneficial for engineers planning to find aerodynamic forces between two spheres.