## Calculation of the Added Mass of a Submerged Object with Variable Sizes at Different Distances from the Wall via Lattice Boltzmann Simulations

Authors : Nastaran Ahmadpour Samani, Shahram Talebi

**Abstract :** Added mass is an important quantity in analysis of the motion of a submerged object ,which can be calculated by solving the equation of potential flow around the object . Here, we consider systems in which a square object is submerged in a channel of fluid and moves parallel to the wall. The corresponding added mass at a given distance from the wall d and for the object size s (which is the side of square object) is calculated via lattice Blotzmann simulation . By changing d and s separately, their effect on the added mass is studied systematically. The simulation results reveal that for the systems in which d > 4s, the distance does not influence the added mass any more. The added mass increases when the object approaches the wall and reaches its maximum value as it moves on the wall (d --> 0). In this case, the added mass is about 73% larger than which of the case d=4s. In addition, it is observed that the added mass increases by increasing of the object size s and vice versa.

Keywords : Lattice Boltzmann simulation , added mass, square, variable size

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