

AN EMBEDDED STRATEGY FOR THE ANALYSIS OF FLUID STRUCTURE INTERACTION PROBLEMS: NUMERICAL IMPLEMENTATION ON GRAPHIC PROCESSING UNITS (GPU) HARDWARE AND EXPERIMENTAL VALIDATION

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Key Words: *GPU, Fluid-solid interaction, Numerical simulation, Experimental validation.*

A Navier-Stokes solver based on Cartesian structured finite volume discretization with embedded bodies is presented. The solver is specially oriented to General Purpose Graphic Processing Units (GPGPU) hardware.

Fluid structure interaction with solid bodies is performed with an explicit partitioned strategy.

The code is validated with an experiment that involves a fully submerged spherical buoy confined in a cubic box, attached to the bottom of the box by a string. A harmonic displacement is imposed to the box with a shake table. Position of the buoy is determined from video records with a Motion Capture algorithm.

The numerical results are compared with the experiments, and allows the validation of the numerically predicted drag and added mass of the body.