

equations[23, 24, 25, 26, 27], and 2) Cartesian cut-cell methods based on the construction of irreg-

approximations at grid interfaces for two grids overlap each other.

1 to the centroids of all the Cartesian cells. A Cartesian cell and its centroid are book-kept using index numbers (

volume and surface flux. If a finite difference method is used, the triangle cells nodes can be just treated as regular inner grid points because they are connecting the mesh within the NWB and the Cartesian grid.

Step 4:

Check all the grid cells within the NWB to see if there is any triangle element, which may occur

3 Flow Governing Equations

The governing equations for the flow field computed

$$E_v = \frac{O}{B}$$

In body-centered grid, Eq. (15) is formed by looping the j index from the

be enforced. To

After a temporally periodic solution is reached, the cylinder is set to free in both streamwise and transverse directions. In all the simulations, $u = 1.5915$ and the mass ratio $\mu_s = 5.0$. To match the wide range of the experimental data of Gri n[42]

References

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- [32] Udaykumar, HS and Mittal, R and Rampunggoon, P. , \Interface Tracking Finite Volume Method for Complex Solid-Fluid Interactions on Fixed Meshes," *Journal of Computational Physics*, vol. 18, pp. 89{97, 2002.









