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Mesh update strategies in parallel finite element computations of flow problems with moving boundaries and interfaces. (English) [Zbl 0848.76036](#)

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Summary: We present strategies to update the mesh as the spatial domain changes its shape in computations of flow problems with moving boundaries and interfaces. These strategies are used in conjunction with the stabilized space-time finite element formulations introduced earlier for computation of flow problems with free surfaces, two-liquid interfaces, moving mechanical components, and fluid-structure and fluid-particle interactions. In these mesh update strategies, based on the special and automatic mesh moving schemes, the frequency of remeshing is minimized to reduce the projection errors and to minimize the cost associated with mesh generation and parallelization set-up. These costs could otherwise become overwhelming in three-dimensional problems. We present several examples of these mesh update strategies being used in massively parallel computation of incompressible flow problems.

MSC:

76M10 Finite element methods applied to problems in fluid mechanics

65Y05 Parallel numerical computation

Cited in **216** Documents

Keywords:

stabilized space-time finite element formulations; mesh generation; incompressible flow problems

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