

PARTS BASED FE MODELING AND MESH UPDATING SCHEME FOR FSI PROBLEMS

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Parts based FE modeling and mesh updating scheme is shown. Mesh updating technique takes a very important role for FSI problems. Conventional techniques which solve elastic problem to rearrange internal nodes is limited to apply to small deformations. When the flow region is subjected to large deformation, it does not work well. Since, it is easily broken down, the mesh quality is difficult to maintain. Also, the technique of switching mesh is not practical, because we need to prepare several meshes or implement the processes of mesh generation, often. It is a strict restriction for most of FSI problems. We propose a simple updating scheme which uses only one mesh throughout whole process of computation. The steps are described as follows: First, prepare a variety of based parts which has small scale and hold fine enough resolution. Second, assemble those parts to make FE models, expand surface nodes to adjust boundary shape and arrange internal nodes by solving elastic problem. Third, continue the rearrangement processes of mesh to adjust the deformation of regions computed from original geometry of parts. All processes are consist of expanding deformation, so it does not suffer mesh troubles. Numerical examples are shown in the presentation. It is noted that the inversion of stiffness matrix is required only one time.