

FICTITIOUS DOMAIN: METHODS AND APPLICATIONS

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Fictitious domain methods were introduced in the sixties to circumvent the requirement to use domain-conforming meshes imposed by the standard finite element method. In the fictitious domain methods, the domain to be analysed is surrounded by an embedding domain whose meshing and, if needed, mesh refinement are simple, if not trivial. Since in these methods the mesh is not directly related with the geometry, a distinct treatment of the elements containing the boundary is needed. This makes necessary to use advanced integration techniques and special procedures to impose boundary conditions, which are still active areas of research. Despite of this, because of their potential to reduce the meshing burden, fictitious domain methods have gained a big interest among the researches who have proposed many methods around the original ideas. The minisymposium will mainly focus on the application of fictitious domain methods to solve solid mechanics problems, including modelling of image-based geometries, multiphysics, etc. The minisymposium will include topics from theoretical and numerical aspects to engineering applications.

Keywords: Fictitious Domain Method; Immerse Boundary Methods; Integration Schemes; Image-Based Analysis