**Simulation of the motion of elliptic bodies in a viscous incompressible fluid** L. HECTOR JUAREZ, Universidad Autonoma Metropolitana-Iztapalapa — In this work we discuss the application of a methodology combining distributed Lagrange multiplier based fictitious domain techniques, finite element approximation, and operator splitting, to the numerical simulation of the motion of elliptic bodies in an incompressible viscous fluid. The interaction between the fluid and the rigid body is implicitly modeled by a global variational formulation, so that we do not compute the hydrodynamical forces explicitly during the simulation. In addition, the fictitious domain method allows the flow computation to be done on a fixed region without re-meshing. Examples of the sedimentation of a elliptic body, and of hydrodynamic pendula will be presented.

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