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Lorena Bociu*, lvbociu@ncsu.edu. *Minimizing Drag in A Moving Boundary Fluid-Elasticity Interaction.*

We are interested in minimizing fluid vorticity in the case of an elastic body moving and deforming inside an inviscid fluid, using a distributed control. This translates into analyzing an optimal control problem subject to a moving boundary fluid-structure interaction (FSI). The FSI is described by the coupling of Navier-Stokes and wave equation. The control is inherently a nonlinear control, acting as feedback on the moving frame. Its action depends on the flow map of the domain, which is itself defined through the dynamics of the problem. A key ingredient in the optimal control problem is represented by the long time behavior of the forced dynamics, which was an open problem in the field. Our results include existence of solutions for all times with small distributed sources and small initial data, as well as existence of optimal control for the problem of minimization of drag in the fluid. (Received August 31, 2020)