Dynamical Shape Control in Non-cylindrical Navier-Stokes Equations

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Abstract: This paper deals with a dynamical shape control problem. The state equations are the non-cylindrical Navier-Stokes equations with a non-homogenous Dirichlet condition. The goal is to compute a necessary optimality condition for the considered functional (kinetic energy). Our work is based on the "transformation" of the domain functional on a field functional and the consideration of transverse fields in the application of the velocity method. The originality of this approach is the introduction of an extra adjoint equation in relation with the initial transverse field to obtain the final form of the necessary condition.

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