Boundary control problems in hemodynamics: mathematical analysis and numerical simulations

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Flow control has been subject of extensive research during the last decades. Optimal control problems in the frame of fluid dynamics, can be applied in several real life application, from automobile to aerospace industries. Here, we present two possible frameworks for the application of control problems in hemodynamics. One related to the velocity tracking problem and another with boundary identification. We discuss theoretical aspects as well as numerical examples for which we will emphasize the computational challenges. The relevance of these techniques for the definition of a personalized tool to be used in a clinical scenario will also be emphasized.

Keywords: Optimal boundary control; Navier-Stokes equations; patient-specific simulations

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