

Fluid-Structure Interaction with Application in Hemodynamics: Analysis and Simulation

Maria Lukacova

Universität Mainz, Institut für Mathematik, Staudingerweg 9, 55099 Mainz

lukacova@uni-mainz.de

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Fluid-structure interaction problems appear in many areas. In the present lecture we will concentrate on specific problems arising in hemodynamics. The aim will be to study the resulting strongly nonlinear coupled system from theoretical as well as numerical point of view. We address theoretical questions of well-posedness and present an efficient and robust numerical scheme in order to simulate blood flow in compliant vessels. With respect to the numerical simulations we will in particular discuss the questions of the added mass effect, stability and convergence order. We will present results of numerical simulations and demonstrate the efficiency of new kinematic splitting scheme.