1067-35-1169 **Suncica Canic*** (canic@math.uh.edu), 4800 Calhoun Rd, Department of Mathematics, University of Houston, Houston, TX 77204-3008. *A moving interface problem in blood flow.*

The study of fluid-structure interaction between blood flow and compliant arterial walls is important in understanding the physiology and the pathology of the human cardiovascular system. The benchmark problem consists of solving the Navier-Stokes equations for an incompressible viscous fluid modeling blood flow in medium-to-large arteries, coupled with the equations of linearly viscoelastic shell modeling the compliant behavior of arterial walls. Due to the particular nonlinearity of the coupling, this problem is difficult to study from both the numerical and analytical points of view. To understand the basic properties of solutions and to simplify the analysis, we derived a reduced, effective model using ideas from homogenization theory. The resulting Biot model is a nonlinear moving-boundary problem of mixed type with degenerate diffusion, defined on a cylindrical domain in 3D. In this talk an existence result will be presented for the reduced Biot model assuming viscoelasticity of arterial walls with the lowest possible smoothing. Experimental results showing excellent comparison between numerical simulation and measurements will be discussed. An application to a problem arising in cardiovascular treatment will be presented. Collaborators: T.B. Kim and A. Mikelic. (Received September 19, 2010)