1030-35-34 **Suncica Canic*** (canic@math.uh.edu), 4800 Calhoun Rd., Department of Mathematics, Houston, TX 77004, **Taebeom Kim** (taebeom@math.uh.edu), 4800 Calhoun, Department of Mathematics, Houston, TX 77004, **Giovanna Guidoboni** (gio@math.uh.edu), 4800 Calhoun, Department of Mathematics, Houston, TX 77004, and **Andro Mikelic** (Andro.Mikliec@univ-lyon1.fr), University of Lyon 1, Lyon, France. *On the existence and uniqueness of a solution to a mixed hyperbolic-parabolic free-boundary problem arising in blood flow modeling.*

We study a fluid-structure interaction problem modeling the flow of blood in medium-to-large human arteries. The model equations describe the coupling between the axially symmetric flow of an incompressible, viscous fluid and the motion of the viscoelastic vessel walls. Assuming the physiologically relevant flow and data this become a difficult problem to analyze due to the competition between the hyperbolic and parabolic effects driving the wave propagation in arterial walls smoothed out by the small vessel wall viscosity and the viscous fluid effects. The resulting reduced, effective model is in the form of a two-dimensional, quasilinear hyperbolic-parabolic system of PDEs. Using energy methods and fixed-point arguments, we obtained the existence of a unique solution to the resulting non-linear free-boundary problem. The numerical solutions are compared with the experimental flow measurements, performed at the Texas Heart Institute, showing excellent agreement between the experiment and the solution of the reduced problem. (Received June 25, 2007)